THE BULLETIN

NOVEMBER
1939
—
VOLUME 7
—
NUMBER 4

THE AMERICAN ASSOCIATION
OF NURSE ANESTHETISTS

HONOR
EMBLEM OF BUSINESS CHARACTER
QUALITY
RICE
LEADERS OF THE WORLD
ASSOCIATION
FOUNDED A. D. 1912 BY ELWOOD E. RICE, LL.D.
HAS INVITED AND ACCEPTED INTO MEMBERSHIP WITH ALL RIGHTS PRIVILEGES HONORS AND INSIGNIA PERTAINING THERETO
PURITAN COMPRESSED GAS CORPORATION
MANUFACTURERS OF
MEDICAL & INDUSTRIAL GASES
GENERAL OFFICES, KANSAS CITY, MO.
BALTIMORE, MD. — ST. LOUIS, MO. — CHICAGO, ILL. — ST. PAUL, MINN. — CINCINNATI, O.
DETROIT, MICH. — CAMBRIDGE, MASS. — NEW YORK, N.Y. — PHILADELPHIA, PA.
IN RECOGNITION OF THE HIGH CHARACTER AND ACHIEVEMENTS OF THIS ESTEEMED ORGANIZATION AND ITS ADHERENCE AT ALL TIMES TO THE PRINCIPLES OF RIGHT BUSINESS CONDUCT WHICH FORM THE ASSOCIATION'S
QUALIFICATIONS FOR MEMBERSHIP
HONOR: A RECOGNIZED REPUTATION FOR FAIR AND HONORABLE BUSINESS DEALINGS.
QUALITY: AN HONEST PRODUCT, OF QUALITY TRUTHFULLY REPRESENTED.
STRENGTH: A RESPONSIBLE AND SUBSTANTIAL FINANCIAL STANDING.
SERVICE: A RECOGNIZED REPUTATION FOR CONDUCTING BUSINESS IN PROMPT AND EFFICIENT MANNER.
WHEREFORE THIS ASSOCIATION OF EMINENT INSTITUTIONS HAS ADJUDGED THE ABOVE MEMBER WORTHY TO RECEIVE THIS OFFICIAL
AWARD OF MERIT
AND TO DISPLAY THE ASSOCIATION'S EMBLEM OF BUSINESS CHARACTER—A RECOGNIZED
WARRANT OF QUALITY AND FAIR DEALING
IN WITNESS WHEREOF—THE ASSOCIATION'S SEAL HAS BEEN AFFIXED HERETO AND ATTESTED BY ITS FOUNDER AND PRESIDENT THIS seventh DAY OF February 1938
RICE LEADERS OF THE WORLD ASSOCIATION
Elwood E. Rice
FOUNDER AND PRESIDENT
AT FIFTH AVENUE
NEW YORK, U.S.A.
STRENGTH
SERVICE

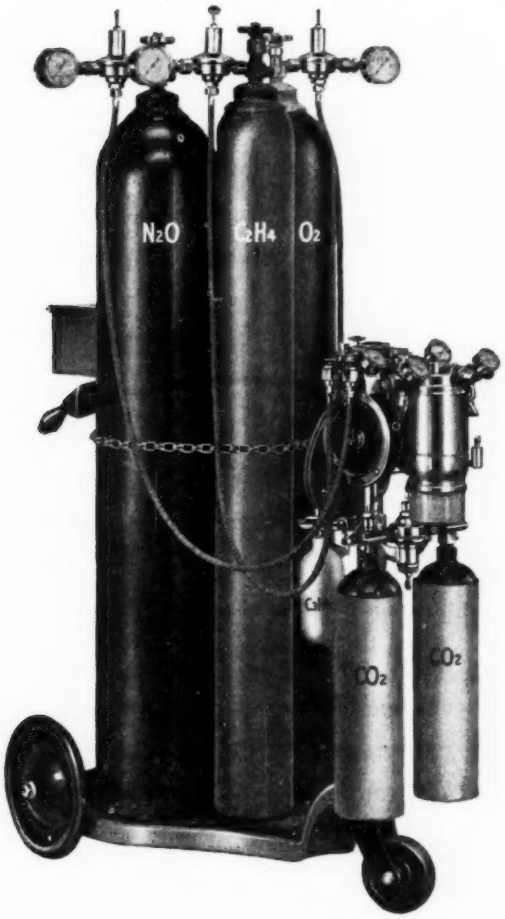
PURITAN COMPRESSED GAS CORPORATION

General Offices, Kansas City, Mo.

Branches and Distributing Dealers in Most Principal Cities

HAVE YOU CONSIDERED

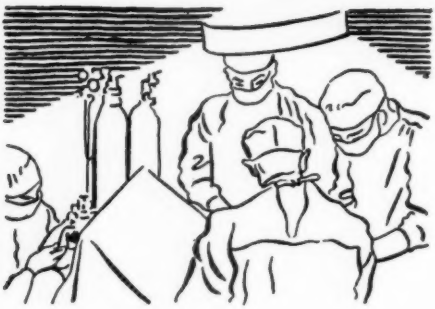
McKESSON?



The new improved Model L Nargraf will take care of every anesthetic need. Any technique may be employed that is best adapted for the individual case—surely a great advantage not found in other equipment.

Literature on request.

THE McKESSON APPLIANCE CO.
Toledo, Ohio



When **DEPENDABILITY** *is essential*

With Soda Lime you must be sure of the absolute reliability of your supply. You have a right to demand a product that has stood the test of time.

Wilson Soda Lime has been proved through two decades of faithful performance. Unflagging research has constantly improved it, and rigorous laboratory control assures its dependable uniformity.

Insist on Genuine Wilson Soda Lime . . . the *accepted* Carbon Dioxide absorbent for the medical profession. Made by Dewey and Almy Chemical Company. Packed in economical, easy-to-use pails.

CONVENIENTLY AVAILABLE FROM YOUR DEALER OR SUPPLY HOUSE

Genuine

WILSON SODA LIME

In Chest Surgery

. . . CYCLOPROPANE ANESTHESIA

IN CHEST SURGERY Knight recommends Cyclopropane as the "inhalation anesthetic of choice" when accompanied by proper precautions "to replace the rapidly absorbable oxygen and anesthetic gas." He says in part ". . . Cyclopropane is the anesthetic of choice. There are no others which compare with it in value for chest surgery. The advantage of high oxygen and ability to carry the anesthesia with quick changes from light to deep and deep to light according to the needs of the situation are all there and all should be taken advantage of."

(Knight, Ralph, Minnesota Medicine, Jan., 1939)

MALLINCKRODT Cyclopropane for Anesthesia is exceptionally pure and uniform with respect to freedom from foreign gases, toxic substances, moisture, etc.; packed in specially designed cylinders to fit standard anesthetic machines. Mallinckrodt Cyclopropane may also be obtained through the various offices of the Puritan Compressed Gas Corporation.

WORTHWHILE LITERATURE UPON REQUEST

2nd & Mallinckrodt Sts.
St. Louis, Missouri
Chicago • Philadelphia

Mallinckrodt
CHEMICAL WORKS

70-74 Gold Street
New York, N. Y.
Montreal • Toronto

The Bulletin of the American Association of Nurse Anesthetists

VOLUME 7, NO. 4 NOVEMBER, 1939

THE CONTENTS

Report of the Seventh Annual Meeting	PAGE
President's Report	257
Report of Executive Secretary	260
Report of Treasurer	264
Report of Membership Committee	266
Report of Educational Committee	266
Report of Public Relations Committee	267
Report of Publishing Committee	269
Report of Revisions Committee	269
Report of Trust Fund Committee	270
Certificate of Incorporation	270
Amended By-Laws	271
Resolutions Adopted	286
Officers Elected	289
Registration List	289
Joint Luncheon Alumnae Associations	292
"The Choice of Anesthesia in Gastrointestinal Surgery"—Arthur W. Allen, M.D.	296
"The Prevention of Anesthetic Explosions"—Warren P. Morrill, M.D.	302
"Anesthesia in Gynecology and Obstetrics"—Wm. D. Fullerton, M.D.	310
"Pentothal Sodium Intravenous Anesthesia with Oxygen in the Two Extremes of Life"—Anne Beddow	319
"The Measured Administration of Anesthetic and Auxiliary Gases"—Helen Lamb	327
Gift	332
In Memoriam	332
Notices	332
Coming Meetings	333

Advertisements:

Puritan Compressed Gas Corporation	Inside front cover
McKesson Appliance Company	253
Dewey and Almy Chemical Company	254
Mallinckrodt Chemical Works	255
The Foregger Company, Inc.	335
E. R. Squibb & Sons	336
The Cheney Chemical Company	Inside back cover
The Ohio Chemical & Mfg. Company	Outside back cover

At the banquet—Tuesday, September 26, 1939

REPORT OF THE SEVENTH ANNUAL MEETING

REPORT OF THE PRESIDENT

As we stand at the threshold of another year at this seventh annual meeting of the National Association of Nurse Anesthetists, we look back on the endeavors and accomplishments of the past, and forward to the promising future which lies before us. This meeting affords a vantage point from which we may survey and appraise the work which has been done in the past and give thought to the coming year. Let us first take into consideration the past —there, for our survey, we find a united group of approximately 2000 people who have become members of an organization with definite aims and ideals. Affiliated with this larger group are twenty-three distinct subsidiary groups organized to aid and further the objectives of the parent association, emphasized and broadened during eight years of organized effort. While we should feel proud of this achievement, we must not be satisfied.

From another angle we see other results of these eight years of organized effort. That hospital administrators are becoming increasingly aware of the existence of our organization is evidenced by the fact that it is becoming common for an applicant to state, "Membership in your organization is a requirement for acceptance to a position for which I have applied." Another survey reveals to us a glimpse of a changing attitude toward the status of the nurse anesthetist in the field of medical service, an awareness that the well-trained, progressive, conscientious nurse anesthetist does fill and fill well a definite place in hospital service. I believe we may look to organization as the reason for any such change.

Again viewing this panorama of the past, we note that the individual in this group of 2000 has changed from an isolated individual or one of an isolated group serving in one hospital, to one who is an integral part of a large group of individuals with a common purpose. She has an increasing cognizance of her obligation to her hospital and her surgeons and to those whom she serves, in attaining and maintaining a high standard for herself in her chosen profession, and she is more and more becoming an articulate part of this group, either in the study and ac-

tivities of the organization itself or in the preparation of scientific papers for publication or presentation at State and National meetings. As a result of the time and effort expended in this work, the members themselves no doubt are the recipients of the greatest benefit, for it is true that nothing worth while is gained without effort. Let us then not be discouraged if our efforts appear at times to be unappreciated and unrewarded. The greatest satisfaction for a piece of work well done does not come from the praise and commendation of others but from proper evaluation of the work by the one who has accomplished it. Effort on the part of anyone must have a twofold purpose—results to the individual and furtherance of the objective for which the effort has been made.

A last survey down the vista of these eight years reveals a spirit of friendliness and cooperation toward our organization on the part of that large hospital group—the American Hospital Association and its State and Sectional groups. Through the State and National meetings held concurrently with these groups which they have made possible, the members have had the benefits of scientific exhibits relating to anesthesia that would not have been possible otherwise, and have been able to attend the Hospital Association meetings of interest to them. We are also indebted to the American Hospital Association for their cooperation in providing space for the executive offices of the National Association at their headquarters in Chicago.

We shall now review the work of the immediate past. The Association has completed its first year at the new headquarters, with a full-time Executive Secretary, and with the passing of time the wisdom of the change has been apparent. Some idea of the activity at headquarters may be gained when we learn that approximately 12,350 pieces of mail have passed through the office during the year.

Two visits to headquarters were made by your President during the year and one trip was made to Toronto to complete arrangements for this Convention. May I add in this connection that your Program Committee, your Executive Secretary and your President have made every effort to arrange a program that is worth while and we sincerely hope that you will feel that your time and money has been well spent. With the exception of the one trip to Toronto, all arrangements for this Convention have been made by correspondence, as there are no local members.

Your President also had the pleasure of attending the Pennsylvania Association meeting in Philadelphia, and the New York State meeting, and regrets that departmental duties and distance made it impossible to accept the invitations to attend the various other State Conventions. The Board of Trustees held one meeting during the year.

One major objective this year has been the revision of the By-Laws to meet the needs of a growing organization. These have been revised after careful and diligent study on the part of the Revisions Committee in collaboration with the Executive Secretary. The Articles of Incorporation, with which the By-Laws must conform, have therefore required changes. This will necessitate legal action. May I ask your careful attention and consideration when these matters are presented to you in detail during the business meeting which follows.

The Educational Committee's work for the year has been concerned with curriculum revisions and appraisal of the Schools of Anesthesia through a questionnaire sent out in January. The cooperation of the the Schools in ex-

ecuting and returning questionnaires was almost 100 per cent, which was most gratifying—another evidence of willingness to cooperate in the establishment of definite educational standards.

The task of a committee in arriving at satisfactory solutions to problems that are nation-wide in scope is sometimes impossible to accomplish through correspondence alone. It is believed that a session for the Instructors of the Schools of Anesthesia to discuss in detail their many problems will be of distinct advantage to this group and to the Educational Committee in furthering educational plans. We have therefore sent a letter to each known School of Anesthesia, asking that the director of the school or a substitute attend this session if possible. May I urge that Instructors from as many of the schools as are represented here be present at this meeting. The Educational Committee will give a detailed account of that Committee's work for the year.

Another quiet and essentially uneventful year has been passed in relation to legislation pertaining to the nurse anesthetist, but the Public Relations Committee has been occupied with the details of formulating a comprehensive questionnaire to hospitals throughout the country to be used for statistical purposes and to make known to the National Association the number and names and location of the nurse anesthetists who are not members of this organization. One result of their findings will be an intensive membership campaign. These matters will be presented to the membership by the Public Relations Committee for consideration.

The Membership Committee has during the year considered and passed upon 415 applications and 401 members have been accepted for membership.

Again referring to the revision of the By-Laws, which are shortly to be presented for action, may I again ask your careful attention to the article covering eligibility. The standards for eligibility have been raised and definitely specified. However, these are broad enough in scope so that those who at present do not have the training prerequisite for active membership may apply for associate membership and those who after a specified time can submit evidence of satisfactory work during this period will be eligible for active membership. It is believed that the minimum standards for membership now specified will be of definite benefit to the organization and that the more detailed outline of specifications for eligibility will be of distinct advantage to the Membership Committee in considering all applications for membership.

The Publications Committee has shown tangible evidence of its activity four times during the year. Although this official publication has shown growth comparable to that of other activities of the organization, we have not exhausted the possibilities which the Bulletin affords in benefits to the membership. During the coming year, if the recommended revision of Article XV, Section 17 of the pending By-Laws, is adopted, an Educational Department will be established in the Bulletin. Suggestions for improvement of the Bulletin, as well as the submission of original articles in the way of editorial comments, new ideas, description of techniques, reports of cases, et cetera, are earnestly desired from the general membership by your Board of Trustees and the Publishing Committee.

The Finance Committee during the first part of the current year prepared a detailed budget for the year. The financial reports in detail will be presented by the Treasurer.

During the year, the following state groups have organized and become affiliated with the National Association: Illinois, Georgia and Washington. Illinois completes the organization of the states having the largest membership. The organization of these states brings the total of organized states to 23. This means that approximately half of the states in the United States have organized within a period of eight years. This in itself is an outstanding achievement, compared with the growth of state organizations in other national groups. It is hoped that sectional grouping to embrace the states with the small memberships will be possible in order to give these states the advantages of state organization. As an example of such grouping within the past several months, the Mid-West Hospital Association, composed of Arkansas, Colorado, Kansas, Missouri and Oklahoma, has invited the nurse anesthetists of those states to hold their annual meeting concurrently with them. A similar affiliation has already been effected with the Southeastern Hospital Conference, representing Alabama, Georgia, Florida, Mississippi and Louisiana—Alabama, Georgia, Mississippi and Florida being officially represented at this time. The Mid-South Post-Graduate Nurse Anesthetists' assembly was the first grouping of this nature within our organization.

During the coming year definite results appear assured in putting into concrete action, especially in the Educational field, work that has been in progress in the various committees during the past several years.

May I express to the officers my appreciation for their support and cooperation, and to the committees for the work that has been accomplished, fully realizing that the work done by these committees determines to a large extent the forward movement of this organization and also realizing and fully appreciating the many denials necessary in their personal lives to meet the demands of organization work. This time has been given graciously and generously. With this spirit in our organization we cannot fail to advance toward our goal—the full realization of the objectives for which this organization was founded.

MIRIAM G. SHUPP

REPORT OF EXECUTIVE SECRETARY

In reviewing the events which have transpired during the past year one is impressed with the fact that we are making progress in new directions. This report will deal only with the activities at Headquarters because the reports of the work as carried forward by the various committees will be given by their respective chairmen. However, in this connection I wish to mention that the work done by some of the committees has entailed considerable work and correspondence on the part of Headquarters.

Correspondence is a major activity at Headquarters. A great deal of checking is needed as to dues, transfers, changes of address and reference material, consequently much time is necessarily consumed in formulating replies. The increasing number of telephone calls requesting information regarding the Association, schools of anesthesia, requirements for membership, et cetera, must receive daily attention, as well as persons who call at Headquarters.

In October, 1938, fifty-eight letters of appreciation were sent to all participants in the program. A letter was sent to the Secretary of each State Association covering the following items:

Suggestions regarding handling of membership cards and dues

Notice of the increase in annual dues, initiation fee and price of the National pin

Information regarding policy adopted as to payment of back dues for reinstatement of delinquent members, and requesting that members be advised to make prompt payment of dues so as to receive the Bulletin

Form for remittance sheet to be sent with transfer of dues to National Treasurer

Form to be used by the State Associations for Statement of Membership Dues with sample of National Statement form showing size to be used.

A copy of the above correspondence and information was also sent to the Treasurer and President of each State Association and to the members of the Board of Trustees.

In January, 1939, a number of telegrams were received regarding rumors of the possibility of the introduction of bills adverse to nurse anesthetists in the legislatures of the states of New Hampshire and Washington. A letter of protest was sent to the Chairman of the Committee on Public Health of the House of Representatives in New Hampshire. A similar letter was sent to four influential persons in the state of Washington. Apparently no serious trouble ever materialized in either state. Although in January there were some rumors of trouble regarding the status of nurse anesthetists in California, we were assured that no legislation inimical to our group was to be brought up at the meeting of the State Legislature at that time. The American Hospital Association issues legislative bulletins at intervals during the year, depending upon the activities of the various legislatures. Last year, eight bulletins were issued and a copy of each was sent to the Chairman of the Public Relations Committee.

During the last week in January, one of the major activities at Headquarters was to assist in making a survey of the Schools of Anesthesia. One hundred and six letters, enclosing questionnaires for the Schools of Anesthesia, were sent to Superintendents of the respective hospitals, and thirty-one follow-up letters were sent. One hundred and one replies were received, either by the return of the questionnaire or a letter stating that they were no longer conducting a School of Anesthesia. These questionnaires revealed information of great significance. It has been interesting to learn how many Schools of Anesthesia are no longer in existence and can therefore be eliminated from the list. The response to these questionnaires, I believe, is very definite proof that the Schools of Anesthesia are anxious to cooperate if given the opportunity. The information received should be encouraging to the Educational and Curriculum Committees and helpful in careful study and development of an educational program.

In February letters were sent to the Presidents of all State Associations requesting suggestions and contributions for the scientific program of the An-

nual Meeting, and for the Educational Exhibit booth. Up to April 1st only three replies had been received in regard to contributions for the program. In the meantime Miss Hazel Petersen of Minnesota, Chairman of the Program Committee, also wrote numerous letters requesting contributions, and a great deal of correspondence was necessary this year to complete the program. The complete report of the committee is embodied in the program of the convention.

In March letters were sent to the Secretaries of all State Associations requesting them to send second notices to the members who had not as yet paid 1939 membership dues. Second notices were also sent to all individual delinquent members in the unorganized states.

In April letters were sent to the Secretaries of all organized states requesting a copy of their By-Laws for the files at Headquarters.

With the help of a parliamentarian the suggested form of By-Laws was prepared during May and June and sent to the Revisions Committee for further suggestions and corrections, and was returned to Headquarters on July 26th.

In July a letter was sent to the Directors of forty-two Schools of Anesthesia giving not less than a six months' course, enclosing a copy of the present Curriculum and asking for suggestions and recommendations, as well as for copies of all record forms used in the Schools of Anesthesia. The Directors of the various schools were reminded of the Instructors' Session as listed in the program and asked to attend same or send a representative. They were also asked to send contributions for the Educational Exhibit booth to the Chairman of the Educational Committee. Correspondence from fourteen Schools of Anesthesia was received at Headquarters and referred to the Chairman of the Educational Committee.

Upon invitation from Mr. John O. Steele, Superintendent of Davis Hospital, Pine Bluff, Ark., and President of the Mid-West Hospital Association, asking the nurse anesthetists to meet with the Mid-West Hospital Association, comprising the states of Arkansas, Colorado, Oklahoma, Kansas and Missouri, a letter was sent to the Presidents of the organized states of Colorado, Oklahoma and Missouri on July 7th, advising them of the invitation from this group to meet with them at their next annual meeting, which is to be held in Kansas City, Mo., April 11th and 12th, 1940. They were asked to get in touch with the members of their Board of Trustees for immediate action upon the matter. A letter was also sent to Mr. Steele and to Miss Florence King, Executive Secretary of the Mid-West Hospital Association, enclosing copy of letter sent to the Presidents of the organized states. No replies were received until August 14th, when Miss Louise Bowden, Secretary-Treasurer of the Colorado Association, wrote stating how grateful and happy they were to accept the opportunity of meeting with this group. Follow-up letters were sent to Missouri and Oklahoma and to the Executive Secretary of the Mid-West Hospital Association but no replies have been received to date.

The National Association received unusual unsolicited publicity recently through the August issue of the magazine "R.N.," with which no doubt a great many of our group are familiar. We understand this magazine is being sent to over 100,000 registered nurses monthly. After the article on "Anesthe-

sia—A Career" was published, approximately 400 requests came in to Headquarters within a period of three weeks, asking not only for the list of schools but many requested all kinds of information as to length of course in various schools, tuition, maintenance, free courses, how certain schools compare with others, asking for advice as to which school to choose, et cetera. These requests have come from every state in the Union except Vermont and Kentucky and requests are still coming in daily. Inasmuch as considerable and varied information was requested besides the list of schools it added a great deal of extra work at Headquarters.

A month previous to each issue of the Bulletin, letters were sent to the Secretaries requesting them to send all material for the current issue of the Bulletin, in due time, to the Chairman of the Publishing Committee, and in August a letter was sent to the Secretary of each State Association asking for a brief report of activities of the Association to be given at the Annual Meeting.

The Executive Secretary attended the annual meetings of the State Associations of Wisconsin, Indiana and Illinois, and one group meeting at St. John's Hospital, Springfield, Ill. One of the greatest satisfactions derived from meetings of this sort is the opportunity which is afforded to assist members with their various problems. It is through this close association and actual contact that we can hope to further and advance the development of our Association.

The State Associations of Georgia, Washington and Illinois were accepted for affiliate membership in the National Association during the past year. Louisiana has applied for affiliation but not all requirements have been met up to date. Twenty-three states, including Hawaii, are now organized.

The following is a brief summary of some of the activities at headquarters:

Applications received during the year	415
Reference letters sent	410
Applications requiring additional data as to hours of theory, signatures of Membership Committee, additional initiation fees, et cetera	166
(62 of these 166 were requests for additional initiation fees)	
Statements of dues sent to members in unorganized states (November, 1938)	635
Requests for additional dues	15

Total paid-up membership September 1, 1939:

Active	1835
Associate	72
Total	1907

Delinquent members — 1939:		New members accepted:	
Active	132	Active	399
Associate	10	Associate	2
Total	142	Total	401

National Association pins mailed	205
Requests for anesthetists	33
Requests for positions	24
Changes of address	431
Transfers from one state to another	252

It is interesting to note that we have now 209 Sisters as members of the National Association, representing twenty-seven states.

Although many details might be more definitely outlined, it would be too time-consuming to attempt to classify all correspondence. During the past year the correspondence has covered 4,678 incoming and 7,669 outgoing pieces of mail on the various subjects referred to and many others too numerous to mention.

There is so much that needs to be done, so many challenging avenues opening up through which we see and realize great possibilities for our organization, that we become impatient at our inability to progress faster, but with the ever-increasing enthusiasm and spirit of progress evidenced by the State Associations as well as by the members at large, I believe we have reason to look forward to a great future.

Respectfully submitted,

ANNA WILLENBORG,
Executive Secretary

REPORT OF THE TREASURER

September 1, 1938 to August 31, 1939 inclusive

Cash in Bank September 1, 1938		$8,597.99

Receipts for year ended August 31, 1939

Initiation fees	$ 756.00	
Dues — National Association	6522.65	
— State Associations	1397.00	
National Pins	205.00	
Reserved for Trust Fund	200.10	
Reserved for Publishing Fund	1041.72	
Sale of advertising space in Bulletin	1520.00	
Convention Registration Fees	154.00	
Interest on Savings Accounts	109.04	
Miscellaneous income	16.00	11921.51
		$20,519.50

Disbursements for year ended August 31, 1939

Initiation fees refunded	$ 12.00
Refund, overpayment of dues	2.25
Transfers to State Associations	601.75
Contribution to American Hospital Ass'n	720.00
Salary of Executive Secretary	2970.00
Publishing National Bulletin	2227.58
Stenographic Service	1497.00
Accounting Service	50.00
Office Equipment	102.50

Office Supplies and Printing	355.66	
Postage	398.04	
Telephone and Telegraph	121.54	
National Pins purchased	105.45	
Books and Periodicals	22.61	
Traveling Expense	484.09	
Convention Expense	1058.30	
Transferred to Trust Fund Gen'l Savings Acct.	557.10	
Transferred to Trust Fund Income Sav. Acct.	7.40	
President's Petty Cash Fund	10.00	
Miscellaneous	46.09	11,349.36
Cash in Bank August 31, 1939		$9,170.14

Consisting of the following:

General Savings Account No. 106581, Cleveland Trust Company	$ 383.41	
General Savings Account No. 102794, National City Bank, Cleveland	5019.34	
General Savings Account No. D15033, Central Nat'l Bank, Cleveland	3011.06	
Commercial acct., Cleveland Trust	756.33	$ 9,170.14

NATIONAL ASSOCIATION OF NURSE ANESTHETISTS TRUST FUND

Deposits

Total accumulated Trust Fund transferred from General Account to Savings Account No. 110399, Cleveland Trust Company, Euclid-105th Street Office, Cleveland, Ohio	$ 557.10	
Interest earned	2.98	
		$560.08

Withdrawals

Transfer of interest earnings to Trust Fund Income Savings Account No. 110398, Cleveland Trust Company, Euclid-105th Street Office	2.98
Balance August 31, 1939	$ 557.10

TRUST FUND INCOME

Deposits

Total accumulated interest transferred from General Fund to Savings Account No. 110398, Cleveland Trust Company, Euclid-105th Street Office	$ 7.40	
Transfer of interest earnings from Trust Fund Savings Account No. 110399 to Savings Account No. 110398	$ 2.98	
Balance August 31, 1939		$ 10.38

The foregoing figures have been verified by the auditor and his report is on file.

Respectfully submitted,

September 15, 1939 GERTRUDE L. FIFE, Treasurer

REPORT OF MEMBERSHIP COMMITTEE

Applications received from September 7th, 1938, to September 11th, 1939—415

Associate Members	5
Associate Member accepted for active membership	1
Applicants not accepted—(one a male anesthetist)	5
Application pending	1

It is interesting to note that 73 Catholic Sisters joined the Association this year.

The following states had the largest number of new members:

Illinois	61	Wisconsin	18
Washington	39	Minnesota	18
Pennsylvania	36	Tennessee	15
Massachusetts	33	Georgia	13
New York	26	Louisiana	12
Texas	19	Ohio	11
Michigan	10		

Respectfully submitted,

MARIAN BRIGGS
FAYE FULTON
THERESA A. MCTURK, *Chairman*

REPORT OF EDUCATIONAL COMMITTEE

During the past year the Educational Committee with the cooperative assistance of our President, Board of Trustees and Executive Secretary has pursued effective studies which are bringing nearer to actual realization our prospective plan of progressively coordinated standards of education for nurse anesthetists; with the envisaged possibility of eventual National Examination and Certification for prospective entrants to the field.

A national survey conducted in this connection during the year, embracing some 106 hospitals and teaching institutions, has disclosed the interesting facts that 39 courses of instruction in this country, located in 18 widely separated states, train each year about 263 graduate nurse anesthetists—an imposing figure which emphasizes the importance of the plans now under study, looking to more synchronized systems of training and education within the field, to establish coordinated standards that may be expected to eventually achieve national significance.

A striking feature of the survey is the great variation presented by the different calendar lengths of time which are consumed in teaching the subject in the various institutions. In this connection, however, it is to be noted that the mere calendar length of time consumed in educating students, is in itself only one factor in the educational equation, whose true significance can be properly evaluated only when it is compared with and related to, other equally

important and influencing factors; such as the scope, variety and activity of the surgical service within the teaching institution, the number of students enrolled in the course at one time, the intensiveness of the didactic system and many other factors with all of which the calendar length of time of a course is inescapably intertwined.

In further connection with the prospective plan of synchronization of training within our field already referred to, it has seemed desirable that minor modifications or amplifications of our present "Pattern Curriculum" be effected, and these are now under active study by this Committee. The Instructors' Round Table at the Toronto Convention is expected to contribute much to the coordination of this work.

In connection with this same subject, and looking to the development of fullest cooperation between the Schools which educate students for entrance to our field (such institutions as have produced our entire present membership and those to whom we must look for the future membership of our Association), a plan is being worked upon which might be called a "National Educational Interchange" or a "National Schools Visitation" program, under which a delegate or an appointed officer of the National Association would visit all functioning schools in the specific interest of coordinating training methods and of promoting within the schools progressive developments of constructive character. Your Committee feels that the plans at present in its hands require further amplification and study before publication, but expects that during the coming year a practical and acceptable working program will have been evolved.

In closing this report, your Committee desires to express appreciation of the splendid cooperation which has been given it by our Officers and by the Schools of Instruction throughout the country, to whom our inquiries have been directed in questionnaire form, and from whose replies have been compiled the data which have been referred to in this present report. With such keenly progressive interest extant in our field, and with such whole-hearted cooperation as has been evidenced, the successful development of the forward-looking educational plans seem assured.

AGATHA HODGINS
ROSALIE MCDONALD
SISTER BORROMEA
FRANCES HESS
HELEN LAMB, Chairman

REPORT OF PUBLIC RELATIONS COMMITTEE

During the past year the Public Relations Committee has concentrated on three definite objectives, namely: (1) the grouping of States into sections; (2) the mailing of a questionnaire to hospital superintendents and presidents of the various state anesthetists' associations making every endeavor to contact anesthetists who are not members of the National; and (3) arranging the handling of such a survey financially.

We announce with pleasure that no adverse legislation in regard to nurse anesthetists was introduced in any State Legislature during 1939.

For several years the National Association has endeavored to locate nurse anesthetists who are not members of our organization and this committee is considering a plan whereby we hope to accomplish this and other important objectives, with the assistance of the National Board of Trustees. However, in order to do this we *must* have the utmost cooperation of the various state anesthetists' associations, and the hospital superintendents. It is the belief of this committee that a questionnaire should be carefully compiled and sent out for the purpose of collecting data regarding the efficiency of the nurse anesthetist service. In addition to this questionnaire we suggest sending a letter to the president of each State Anesthetists' Association, notifying them of our endeavors and asking their cooperation in obtaining the desired information; such data to be kept on file at Headquarters and available to the states at any time.

Another important task of this committee has been the study of the problem of State grouping into sections, the primary purpose being to bring together anesthetists of an area larger than that of a single state for annual conferences. This in no way is meant to replace state associations but rather to increase their effectiveness by bringing them together with their respective Hospital Associations. States having insufficient membership to permit excellent separate meetings will find this grouping of states more beneficial educationally, economically and socially. When grouping of states into sections has been accepted this committee will then submit suggestions in regard to the functions of each group.

It has been decided to defer the combination of State groups into Sectional Associations until a later date, pending the action of the Hospital Associations.

In conclusion, the Public Relations Committee makes the following recommendations:

First: That letters be sent to State Association Presidents explaining the survey.

Second: That questionnaire be sent to Hospital Superintendents.

Third: That consideration be given to the question of a satisfactory method of handling the survey financially.

Fourth: That States be combined into sections as suggested.

Respectfully submitted,

M. J. R. Stevenson	California
Virginia G. Holland	Texas
Mary Brown	Florida
Hazel Petersen	Minnesota
Hilda R. Salomon, Chr.,	Philadelphia

In Toronto
Alice L. Anderson—Minnesota
Rosalie MacDonald—Georgia
Grace Richardson—Texas

REPORT OF PUBLISHING COMMITTEE

FINANCIAL STATEMENT

Surplus in Publishing Fund, August 31, 1938			$ 738.09
Publishing Fund accumulated September 1, 1938 to August 31, 1939 (subscription price of Bulletin—50c, deducted from dues of each individual member, plus sale of Bulletins to non-members)	$1041.72		
Income from Sale of Advertising, September 1, 1938 to August 31, 1939	1520.00	$2561.72	
Total Cost of Publishing Bulletin, including postage, for year ending August 31, 1939	2227.58		
Profit for year 1939			$ 334.14
SURPLUS, August 31, 1939			$1072.23

COMPARATIVE STATISTICAL REPORT FOR YEARS 1933-1939 inclusive:

Year	No. of pages exclusive of Advertising	No. copies Distributed	Total cost of publishing Bulletin, including postage	Advertising Pages	Advertising Income
1933 (1 issue)	43	1,500	$ 331.22	5	$ 150.00
1934 (1 issue)	44	1,500	241.17	6	310.00
1935 (3 issues)	149	3,671	762.92	16	820.00
1936 (3 issues)	185	4,600	1,056.24	19¾	911.00
1937 (4 issues)	206	6,400	1,422.73	28	1,270.00
1938 (4 issues)	232	7,075	1,992.98	29	1,305.00
1939 (4 issues)	274	8,600	2,227.58	30	1,565.00

Respectfully submitted
Gertrude L. Fife, Chairman
Harriet L. Aberg
Rose G. Donovan
Jewelle C. Fink

September 15, 1939

REPORT OF REVISIONS COMMITTEE

The Revisions Committee received for their consideration during the past year the proposed Constitution and By-Laws of Georgia, Washington, and Illinois.

In the case of the Constitution and By-Laws of the State Associations of Georgia and Washington, the committee recommended a few minor changes. As regards the Constitution and By-Laws of the State Association of Illinois, it was the opinion of the committee that the forms submitted deviated considerably from the type of Constitution and By-Laws that this committee had been led to believe was desirable in order to attain a satisfactory degree of uniformity among the various state associations.

The committee was asked to prepare suggested forms for Constitution and By-Laws to serve as a guide to the various states in the process of organization. Such forms, based upon the Constitution and By-Laws of the New York State Association, were made up and forwarded to National Headquarters.

The new proposed By-Laws of the National Association were prepared at Headquarters, but reviewed by the committee. This committee believes that these By-Laws are definitely a step forward in the work of the Association and urge their adoption at this meeting.

Respectfully submitted,

HAZEL BLANCHARD, *Chairman*

REPORT OF TRUST FUND COMMITTEE

The committee makes the following recommendations:

(1) That the first sentence under (4), page 421, Report of Trust Fund Committee, published in the November, 1937, issue of the Bulletin, which reads: "*The purpose for which this Trust Fund is created is to provide for such members of this Association who may become indigent through age or physical disability*" be amended by inserting on the fourth line after "*or*" and before "*physical*" the word "*permanent.*"

(2) That the first phrase of second paragraph under (5), page 422, of November, 1937, Bulletin, which reads:

"*When said proposed home for the purpose of providing care and maintenance for indigent and infirm members who qualify hereunder for such maintenance,*" be amended to read:

"*When said proposed home for the purpose of providing care and maintenance for members who are indigent because of age or permanent physical disability, who qualify hereunder for such maintenance.*"

(3) That: in the last paragraph of the document, page 422, November, 1937, Bulletin, line 13 be amended by inserting after "*said funds*" and before "*shall then*" the words "*and accumulated unused interest.*"

(4) That: Copy of the Trust Fund document as amended be published annually in the ——— issue of the Bulletin.

Respectfully submitted,

IDA TELFORD ELLIS
GERTRUDE L. FIFE
VERNA M. RICE, *Chairman*

The recommendations of the Trust Fund Committee were accepted, with the exception of No. 4, which was referred back to the Committee for further study.

In Toronto
Marjorie Lee Watts—Florida
Mary C. Brown—Florida

CERTIFICATE OF INCORPORATION

of

AMERICAN ASSOCIATION OF NURSE ANESTHETISTS

STATE OF ILLINOIS)
Cook County) SS

To Edward J. Hughes, Secretary of State:

We, the undersigned, citizens of the United States, propose to form a corporation under an Act of the General Assembly of the State of Illinois, entitled, "An Act concerning Corporations," approved April 18, 1872, and all Acts amendatory thereof; and for the purpose of such organization we hereby state as follows, to-wit:

1. The name of such corporation is American Association of Nurse Anesthetists.

2. The object for which it is formed is

   1. To advance the Science and Art of Anesthesiology.
   2. To develop educational standards and technique in the administration of Anesthetics.
   3. To facilitate efficient cooperation between nurse anesthetists and the medical profession, hospital and other agencies interested in Anesthesiology.
   4. To publish periodicals and to issue bulletins from time to time to aid in the general purpose of the organization.
   5. To establish and maintain a central bureau for information, reference and assistance in matters pertaining to the Science and Art of Anesthesiology.
   6. To promulgate an educational program with the object of disseminating through proper channels, the importance of the proper administration of anesthetics.

3. The management of the aforesaid American Association of Nurse Anesthetists shall be vested in a board of Eight (8) Trustees.

4. The following persons are hereby selected as the Trustees to control and manage said corporation for the first year of its corporate existence, viz.:

Miriam Shupp	260 Crittendon Blvd.	Rochester, N. Y.
Sister M. Borromea	St. Francis Hospital	Peoria, Ill.
Gertrude Fife	2065 Adelbert Rd.	Cleveland, Ohio
Agatha Hodgins	Chatham, Bridge St.	Cape Cod, Mass.
Hilda Salomon	Jewish Hospital	Philadelphia, Penn.
Theresa McTurk	1903 Green St.	Philadelphia, Penn.
Dorothy Hoadley	Harris Mem'l Methodist Hosp.	Fort Worth, Tex.
Louise Schwarting	Lutheran Hospital	Fort Dodge, Ia.

5. The location is in the city of Chicago in the county of Cook in the State of Illinois, and the post office address of its business office is at No. 18 East Division Street in the said City of Chicago.

(Signed) Mae B. Cameron, Ravenswood Hospital, Chicago, Ill.
Maud Lane, Englewood Hospital, Chicago, Ill.
Anna Willenborg, 18 E. Division St., Chicago, Ill.

STATE OF ILLINOIS)
Cook County) SS

I, Emma A. Schmidt, a Notary Public in and for the County and State aforesaid, do hereby certify that on this 11th day of October, A.D. 1939, personally appeared before me Mae B. Cameron, Maud Lane and Anna Willenborg, to me personally known to be the same persons who executed the foregoing certificate, and severally acknowledged that they had executed the same for the purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year above written.

(SEAL) (Signed) EMMA A. SCHMIDT
Notary Public

Filed Oct. 17, 1939, Edward J. Hughes, Sec'y of State

CERTIFICATE NUMBER 8967
STATE OF ILLINOIS

OFFICE OF THE SECRETARY OF STATE

To all to whom these Presents Shall Come, Greeting:

Whereas, a Certificate, duly signed and acknowledged, has been filed in the Office of the Secretary of State on the 17th day of October, A.D. 1939, for the organization of the AMERICAN ASSOCIATION OF NURSE ANESTHETISTS under and in accordance with the provisions of "An Act Concerning Corporations" approved April 18, 1872, and in force July 1, 1872, and all acts amendatory thereof a copy of which certificate is hereto attached:

Now Therefore, I, Edward J. Hughes, Secretary of State of the State of Illinois, by virtue of the powers and duties vested in me by law, do hereby certify that the said American Association of Nurse Anesthetists is a legally organized Corporation under the laws of this State.

In Testimony Whereof, I hereto set my hand and cause to be affixed the Great Seal of the State of Illinois. Done at the City of Springfield this 17th day of October, A.D. 1939, and of the Independence of the United States the one hundred and sixty-fourth.

(signed) EDWARD J. HUGHES
(SEAL) Secretary of State

BY-LAWS OF THE AMERICAN ASSOCIATION OF NURSE ANESTHETISTS

The following By-Laws were adopted at the seventh annual meeting in Toronto, Canada, Tuesday afternoon, September 26, 1939:

Article I

MEMBERSHIP

Section 1. Membership in this Association shall be by State or Sectional Association and Individual.

Section 2. State or Sectional Divisions:

Any association of Nurse Anesthetists, formed in any state of the United States or any Sectional Association composed of members who are Nurse (women) Anesthetists in two or more states, may become affiliated with the American Association of Nurse Anesthetists in the State or Sectional Association Division provided:

a. That the requirements and standards for membership in the State or Sectional Association correspond in all respects to the requirements and standards for individual membership in the American Association.

b. That the State or Sectional Association agrees to accept, without reservation, the requirements of the By-Laws of the American Association of Nurse Anesthetists and cooperate fully with the American Association of Nurse Anesthetists in the purpose for which it was formed.

c. That the State or Sectional Association pay into the Treasury of the American Association of Nurse Anesthetists annual dues in the amount as specified under Article XII, Sections 3 and 4 for every member appearing on its roll during the time that such State or Sectional Association is affiliated as a member of the American Association of Nurse Anesthetists. Every applicant applying for membership in the American Association of Nurse Anesthetists shall pay an initiation fee in the amount as specified under Article XII, Section 2, said fee to accompany the application.

Section 3. Every individual member of a State or Sectional Association which has become affiliated with the American Association of Nurse Anesthetists shall be, by virtue of her membership in said State or Sectional Association, a member of the American Association of Nurse Anesthetists and shall be entitled to all the rights and benefits of any other individual member of the American Association of Nurse Anesthetists subject to the same qualifications and restrictions which apply to all individual members.

Section 4. Any State or Sectional Association desiring to become affiliated in the State or Sectional Division of this Association shall make application on the form approved by the Board of Trustees of the American Association of Nurse Anesthetists and furnished to such applicant by the Executive Secretary.

Such application shall be submitted by applicant provided the application is executed pursuant to the affirmative vote of a majority of the members entitled to vote in such State or Sectional Association at a meeting called for such purpose.

The application with a copy of the Constitution and By-Laws shall be sent to the Executive Secretary of the American Association of Nurse Anesthetists.

Section 5. In no event shall the American Association of Nurse Anesthetists be liable for debts or obliga-

tions of any kind whatsoever, incurred by any State or Sectional Association which may be affiliated with the American Association except such obligations as may be expressly entered into and authorized by the Board of Trustees of the American Association.

Any State or Sectional Association which fails to comply with the By-Laws and Standing Rules of the American Association of Nurse Anesthetists may be dropped as an affiliate member by a unanimous vote of the Board of Trustees, providing due notice to comply has been given at least three months before the vote is taken and during which time said Association has failed to act in accordance with these requirements.

Article II

APPLICATION OF THE TERM "STATE"

The term "State" in these By-Laws shall be understood to apply equally to any State in the United States of America, to the District of Columbia or to any territory, possession or dependency of the United States of America and the rights, privileges, responsibilities, and obligations of all members in the States, the District of Columbia, the territories, possessions or dependencies shall be the same.

Article III

DUTIES OF STATE AND SECTIONAL ASSOCIATIONS

Section 1. It shall be the duty of each State and Sectional Association:

a. To require that all of its members have the qualifications as enumerated in Article V—Individual Membership of these By-Laws.

b. To send to the President and to the Executive Secretary of this Association the names and addresses of all officers immediately after their election or appointment.

c. To adopt and keep in force, By-Laws consistent with the By-Laws of this Association; to refrain from adopting any changes or modifications in its By-Laws without first obtaining the written approval of the Committee on Revision of this Association; to keep on file with this Association at all times, a complete and up-to-date copy of its Constitution and By-Laws.

d. To comply with all the provisions of these By-Laws.

e. To report to the Board of Trustees of this Association as required.

Article IV

TRANSFERS

A member who changes the location of her employment from the state through which she holds membership in the American Association of Nurse Anesthetists to another state in which there is a state organization, is eligible to membership in the State Association of her new location on the presentation of a transfer card and an official statement that her dues have been paid in full in the Association in which she holds membership provided that no evidence which would otherwise disqualify her for membership arises.

Article V

INDIVIDUAL MEMBERSHIP AND STATE MEMBERSHIP

Section 1. Applications:

a. Applications for individual membership shall be in writing, addressed to the Executive Secretary on blanks approved and provided by the American Association of Nurse Anesthetists.

b. The initiation fee, the amount as specified under Article XII, Section 2, shall accompany the application.

c. All applications shall be referred by the Executive Secretary to the

American Committee on Membership which shall carefully investigate and consider the professional and personal qualifications of all applicants. Upon the findings of this Committee the applications shall be approved or rejected.

d. Applicants approved for membership in the organized states shall be notified of their acceptance by the Secretary or Secretary-Treasurer of the state in which they are located after notification of these officers by the Executive Secretary.

e. Applicants approved for membership in the unorganized states shall be notified of their acceptance by the Executive Secretary of the American Association of Nurse Anesthetists.

f. Applicants who have been notified of their acceptance are requested to pay the required annual dues within thirty (30) days after notification. Unless for satisfactory reasons, applicant does not pay dues within ninely (90) days after notification, she shall forfeit her right to membership and must reapply as a new member or pay dues from the day following the thirty (30) days of her notification. All applicants shall be informed to this effect when notified of their acceptance.

Section 2: Classification:

Membership in the American Association of Nurse Anesthetists shall consist of three classes: Active, Associate, Honorary.

Section 3. *Active Membership:*

An applicant for active membership shall meet the following requirements:

a. Graduation from an accredited School of Nursing.
b. State Registration.
c. Annual renewal of registration if so required in the state in which she is employed.
d. Graduation from a School of Anesthesia, recognized by the American Association of Nurse Anesthetists and giving not less than a six (6) months' course.
e. An applicant who has been graduated from a recognized School of Anesthesia giving not less than the minimum six (6) months' course shall upon completion of her course, be eligible for active membership.
f. An applicant who has been engaged in the giving of anesthetics for a period of six (6) years prior to 1939 but who has not been graduated from a special course in the administration of anesthetics, may upon the presentation of the required credentials as approved by the Board of Trustees, apply for active membership. Said applicant must be engaged in the administration of anesthetics when application for membership is made.
g. An applicant who has had a special course in the administration of anesthetics of less than six (6) months' duration prior to 1939 and does not qualify for active membership but has since that time rendered satisfactory service in anesthesia for a period of two (2) years in an approved hospital and whose work conforms to a high standard of professional attainment, may upon the presentation of the required credentials as approved by the Board of Trustees, be admitted as an active member if, in the judgment of the Membership Committee, such action is desirable.
h. On and after January 1, 1941, applicants for active membership must meet the requirements as specified in the Revised Cur-

riculum approved by the Board of Trustees.

i. Any nurse having been graduated from an accredited School of Nursing on or after January 1, 1940, shall not be eligible for membership in the American Association of Nurse Anesthetists unless she has taken the required special course in the administration of anesthetics as approved by the Board of Trustees.

j. Any member who is no longer engaged in the administration of anesthetics but who was accepted as an active member may retain her membership as such with the right to vote but not to hold office, as long as she conforms with the rules of the Association.

Section 4. .*Associate membership:*

a. An applicant who does not meet the full requirements for active membership shall be eligible for associate membership upon the recommendation of the Membership Committee or Board of Trustees.

b. An associate member who, at the time of her application was eligible for active membership, but for satisfactory reasons became an associate member, requests active membership must make application for active membership and pay the required initiation fee.

c. An associate member, who was approved as an active member and paid dues as such but for satisfactory reasons became an associate member and again desires active membership after a period of more than two (2) years must reapply for active membership.

d. If a member is no longer actively engaged in the administration of anesthetics and has retired because of age, or physical disability, or has changed her service or married, she is eligible for associate membership upon reapplication for such classification.

e. An active member who for reasons satisfactory to the Board of Trustees, such as illness, or absence from the United States for a period of not less than one (1) year may during this time be allowed associate membership upon reapplication for such classification.

f. A special blank shall be provided to applicants for associate membership by the Executive Secretary who shall refer all applications to the Membership Committee for consideration.

g. Associate members shall be privileged to attend all meetings of the Association; they may have a voice but shall not have the right to vote or hold office.

h. No nurse actively engaged in the administration of anesthetics who is eligible for active membership in the American Association of Nurse Anesthetists, shall be entitled to associate membership.

Section 5. Honorary membership may be conferred by a unanimous vote of the voting body at any annual meeting on persons who have rendered distinguished service to Anesthesiology or to the American Association of Nurse Anesthetists, the names having been recommended by the Board of Trustees. Honorary members shall have all the rights and privileges of the Association except that they shall not be entitled to hold office or vote and they shall be exempt from the payment of dues.

Article VI

DONORS AND BENEFACTORS

Contributors to the American Association of Nurse Anesthetists of sums not less than One Hundred Dollars ($100.-00) shall be known as Donors and such contributors of Five Hundred Dollars

($500.00) or more shall be known as Benefactors.

The names of all such contributors shall be recorded in the annals and history of the American Association of Nurse Anesthetists.

Article VII

BOARD OF TRUSTEES

Section 1. The President, First Vice-President, Treasurer and five other active members of the Association shall constitute the Board of Trustees. The President shall be the Chairman of the Board of Trustees.

Section 2. The election of the Trustees shall be held at the Annual Meeting of the Association. They shall serve for a period of three (3) years each.

Section 3. Regular meetings of the Board of Trustees shall be held immediately preceding and immediately following each Annual Meeting of the Association at the place where such Annual Meeings shall be held.

Special meetings of the Board of Trustees may be called by the President at such times as the business of the Association may require or upon written request of five (5) members of the Board of Trustees. Only business given in the call for the meeting may be transacted at any special meeting.

Article VIII

DUTIES OF BOARD OF TRUSTEES

Section 1. The Board of Trustees shall:

a. Have the control and management of the business, funds and property of the Association.

b. Select a place for deposi' of funds.

c. Promulgate and enforce rules governing the use of the property and funds of the Association and have such other powers with respect to the activities of the Association as may be conferred by the members by resolution enacted at any regular or special meeting and shall further have such other powers as are incidental and necessary to the carrying out of the foregoing powers.

d. Transact the general business of the Association in the interim between Annual Meetings.

e. From time to time make and change rules and regulations not inconsistent with the Articles of Incorporation and By-Laws for the management of the Association business and affairs as indicated.

f. Adopt rules for the conduct of its own business.

g. Pass upon the applications of State or Sectional Associations who wish to become affiliated with the American Association of Nurse Anesthetists.

h. Establish rules and procedure for the various committees and for the discipline of members of the committees.

i. Determine all matters of policy concerning the curriculum and general set-up for the Schools of Anesthesia and make final decisions as to which of these Schools shall be placed upon the approved list.

j. All matters requiring action by the Board of Trustees between its meetings may be voted upon by mail provided that notice of such proposed action is given each member.

k. Fill vacancies in its own membership or among officers of the Association until the next election.

l. Appoint a member of the Association to act as Executive Secretary for such term as they may deem advisable to designate, define her duties except as herein provided, fix her compensation and remove said Executive Secretary for any reason sufficient to the Board for such action.

m. At each Annual Meeting of the Association present a report of its work for the year with recommendations.

n. The Board of Trustees may formulate rules governing the expenditure of money to meet the necessary running expense and fixed charges of the Association, as well as such rules governing its own actions as it may deem necessary or desirable.

o. Definite outline of rules shall be presented to each member of the Board.

p. At the expiration of her term of office, each member of the Board shall within one (1) month, turn over to the President or to her successor in office or as directed by the President, all minutes of the meetings of the Board and any other material or correspondence of the Association in her possession.

Article IX
ADVISORY COUNCIL

Section 1. The Presidents of all State Associations and the Chairmen of all Standing Committees of the American Association of Nurse Anesthetists shall constitute an Advisory Council, to consider and promote the interests of the American Association of Nurse Anesthetists.

Section 2. The duties of the members of the Advisory Council shall be to keep the American Association of Nurse Anesthetists informed of the progress and activities of the States and Committees which they represent and to cooperate with the American Association of Nurse Anesthetists in all matters pertaining to the Association.

Section 3. The Advisory Council shall discuss all matters of importance concerning State Associations and these Committees and present recommendations for consideration of the Board.

Section 4. In the event of the inability of the President of a State Association to attend meetings, an alternate shall be appointed by the State Association to represent her organization on the Advisory Council.

Section 5. In the event of her inability to attend meetings, the Chairman may appoint a member of her Committee to represent her on the Advisory Council.

Section 6. Meetings of the Advisory Council shall be held in connection with each Annual Meeting, at such times as shall be designated in the Program and at such other times during the Annual Convention as shall be determined by the Board of Trustees.

Article X
OFFICERS

Section 1. The Officers of this Association shall be a President, President-Elect (following the election at the Annual Meeting in 1941), First Vice-President, Second Vice-President, Treasurer and Historian, and, with the exception of the Historian shall be elected for terms of one (1) year each at the regular Annual Meeting of the members of the Association. No Officer with the exception of the Treasurer may succeed herself for more than two (2) consecutive terms of office of one (1) year each. The Historian shall be appointed by and hold office for such term as is designated by the Board of Trustees.

Section 2. Members elected as Officers must be actively engaged in the administration of anesthetics.

Section 3. No member shall be eligible for the office of President who has not served on the Board of Trustees for at least one (1) year.

Section 4. No member shall hold office in the American Association of Nurse Anesthetists and at the same time hold office in a State or Sectional Association.

Section 5. There shall be elected at the Annual Meeting in 1941 and at every subsequent Annual Meeting, a Presi-

dent-Elect, who shall serve as President-Elect until the adjournment of the following Annual Meeting at which time she shall assume the office of President. After 1941 there shall be no election of a President.

The President-Elect shall be ex-officio member of the Board of Trustees but without the right to vote.

Section 6. The Executive Secretary shall:

a. Be appointed by and hold office for such term as shall be designated by the Board of Trustees.

b. Work under direct supervision of the Board of Trustees.

c. Attend meetings of the Board of Trustees, Advisory Council, Executive Committee and such Committees as directed by the Board of Trustees.

d. Be kept informed of the work of the State and Sectional Associations and of the Standing and Special Committees.

e. Sign membership cards of all members who have been elected to membership in the Association.

f. Keep an alphabetical list of members and of the personnel of Committees.

g. Submit a report at the Annual Meeting of the members and the Board of Trustees and at such times as may be requested of her by the President or Board of Trustees and generally perform such duties as may be required of her by the Board of Trustees.

Article XI

DUTIES OF OFFICERS

Section 1. The President shall:

a. Preside at the Annual Meeting of the members of the Association, at all meetings of the Board of Trustees, Advisory Council and Executive Committee.

b. Appoint all Standing and Special Committees with the approval of the Board of Trustees.

c. Be a member ex-officio of all Committees except the Nominating Committee.

d. Countersign all checks.

e. Prepare and read at each Annual Meeting of the Association and at the regular Annual Meeting of the Board of Trustees a condensed narrative report of the work of the year.

f. On the first day of the Annual Meeting, appoint the necessary tellers and inspectors of election.

g. Perform all other acts and duties of a general nature as may be incident to her office and as may be, from time to time, required of her by the Board of Trustees.

Section 2. The Vice-Presidents shall:

According to rank perform all of the duties of the President in the event of the latter's absence, disability, resignation, removal from office or death.

Section 3. The Treasurer shall:

a. Collect and receive all moneys of the Association, pay all bills and disburse funds as directed by the Board of Trustees.

b. Deposit funds in banks designated by the Board of Trustees.

c. Be bonded for such sum as the Board of Trustees shall direct, the expense of same to be paid by the Association.

d. Notify all members when in arrears of dues.

e. Keep the Executive Secretary informed regarding the delinquent members.

f. Report to the Board of Trustees the financial standing of the Association at each Annual Meeting and upon request.

g. Perform all such other and further duties as may be required of her by the President or Board of Trustees.

h. The Treasurer's books shall be

audited previous to the Annual Meeting by a certified public accountant.

i. At the expiration of her term of office, the Treasurer shall deliver all moneys, property and rights of the Association in her hands to her successor in office or to the President.

Section 4. The Historian shall:

Present at the Annual Meeting of the members of the Association a written history of the current year which will include such interesting events in the life of the Association and its members as will contribute to the historical background of the American Association; such record to be in duplicate, one copy to be placed in a loose-leaf history record book and passed on to her successor and the other to be kept in the archives of the Association.

Article XII

FINANCE

Section 1. All initiation fees and dues shall be payable in advance.

Section 2. Initiation fee of Two Dollars ($2.00) must accompany application.

Section 3. The annual dues for active membership shall be Six Dollars ($6.00), first dues payable within thirty (30) days following notification of election to membership and thereafter due and payable in full to the Treasurer immediately following the Annual Meeting.

In the organized states:

Two Dollars ($2.00) per capita to be retained by the State Association.

Four Dollars ($4.00) per capita to be transferred to the American Association.

Section 4. The annual dues for associate membership shall be Three Dollars ($3.00), first dues payable within thirty (30) days following notification of election to membership and thereafter due and payable in full to the Treasurer immediately following the Annual Meeting.

In the organized states:

One Dollar and Twenty-Five Cents ($1.25) per capita to be retained by the State Association.

One Dollar and Seventy-Five Cents ($1.75) per capita to be transferred to the American Association.

Section 5. The State Associations or Sectional Associations shall be responsible for collecting all dues from their members and shall send the required per capita dues to the Treasurer of the American Association with the prescribed remittance sheet.

Section 6. Individual members located in unorganized states shall send the required annual dues direct to the Treasurer of the American Association.

Section 7. Annual dues for new members paid on or after July 1, up to September 1 of the year in which application is made, shall include membership up to September 1 of the ensuing year.

Section 8. Members failing to pay dues by January 1 shall be notified by the Treasurer and those delinquent on May 1, unless satisfactory arrangements are made for the payment of dues, shall forfeit all rights to membership and their names shall be taken from the roll of membership.

Section 9. Members who have been dropped for non-payment of dues may be reinstated upon payment of dues accruing at the time of suspension.

Section 10. If two (2) or more years have elapsed since a member has been in good standing, she must make application as a new member and pay full current dues including initiation fee or pay a reinstatement fee of Ten Dollars ($10.00) in addition to the current an-

nual dues and state reasons for delinquency.

Section 11. The names of the members in good standing shall be published each year in the August issue of the Bulletin.

Section 12. Registration Fee.

All members of the Association attending the Annual Meeting shall pay a registration fee in such amount as may be determined by the Board of Trustees, notice of which shall be included in the call for the Annual Meeting.

Section 13. Fiscal Year.

The fiscal year of this Association shall be from September 1 to August 31 inclusive.

Article XIII

ANNUAL MEETING

Section 1. The regular Annual Meeting of the members of the Association shall be held each year concurrently with the American Hospital Association at the time and place designated by the American Hospital Association.

Section 2. The time and place of the Annual Meeting shall be announced in the Bulletin of the American Association of Nurse Anesthetists.

Article XIV

QUORUM

Section 1. Seventy-five (75) members shall constitute a quorum for the transaction of business at any Annual Meeting of the members of the Association, provided at least ten (10) states are represented by members entitled to vote.

Section 2. A majority of the members of the Board of Trustees shall constitute a quorum for the transaction of business at any regular or special meeting of the Board of Trustees.

Section 3. Ten (10) members of the Advisory Council shall constitute a quorum for the transaction of business at the meetings of the Advisory Council.

Article XV

STANDING COMMITTEES

Section 1. The following Standing Committees shall be appointed by the President subject to the approval of the Board of Trustees to serve for the term of one (1) year and until their respective successors are appointed. They shall consist of not less than three (3) members each:

Membership
Revisions
Publication
Legislative
Nominating
Curriculum
Education
Educational Exhibit
Educational Correlating Committee
Program
Convention Arrangements
Finance
Trust Fund
Executive

Section 2. Special Committees may be created by the President subject to the approval of the Board, to perform special functions for which they are created.

Section 3. In case of vacancies in Committees occurring during the interval between Annual Meetings, the President shall have the power to appoint active members to fill the vacancies until the next Annual Meeting and not otherwise provided for in these By-Laws.

Section 4. American Association Committees shall be under the control of the Board of Trustees.

Section 5. Rules and regulations shall be devised by the Board of Trustees for all Committees.

Section 6. The Chairman of each Committee shall send to the President copies of all important letters and other matters transacted or sent out by these chairmen to be presented to the Board if the President deems it necessary. The Chairman of each Committee shall be responsible for rendering a quarterly report to the Board of Trustees and a full report of the activities of the year at the Annual Meeting and at such times as requested by the President.

Section 7. Any member of a Committee who fails to fulfill duties as assigned to her shall be liable to dismissal upon approval of the majority of the Board of Trustees. The vacancy shall be filled by the President upon the approval of the Board of Trustees.

Section 8. The retiring Chairman of each Committee shall within one month after the close of the Annual Meeting, deliver to her successor all papers necessary to carry on the function of this Committee.

Section 9. Membership Committee.

a. This Committee shall check the qualifications of the applicants applying for membership according to the requirements of the By-Laws and if sufficient data is not furnished on the application form, shall secure such data by correspondence.

This Committee shall determine the eligibility of the applicants and make its recommendations and notify the Executive Secretary of its decisions.

b. Due to error or misrepresentation, the Membership Committee shall, subject to the approval of the Board of Trustees, have the power to rescind its action relating to the status of any individual member.

Section 10. Revisions Committee.

a. The Constitution and By-Laws of any State or Sectional Association applying for affiliate membership with the American Association of Nurse Anesthetists shall be referred to this Committee for their consideration and investigation as to the conformity in all respects with the Articles of Incorporation and By-Laws of the American Association.

b. This Committee shall receive all proposed amendments to the By-Laws of this Association and report its findings and recommendations to the Board of Trustees for their approval. Such amendments shall be submitted for action to the Assembly at the Annual Meeting.

c. Proposed amendments to the Constitution and By-Laws of all States or Sectional Associations shall, before they are adopted by the State or Sectional Associations, be submitted to the American Association Revisions Committee for suggestions and approval for the purpose of keeping them in harmony and conformity with the By-Laws of the American Association.

d. The Executive Secretary shall be a member ex-officio of this Committee.

Section 11. Publication Committee.

a. The Committee on Publications shall cause to be published, subject to the approval of the Board of Trustees, such periodicals, bulletins and other publicity material as will assist in the general purpose of the organization.

b. This Committee may be enlarged at the discretion of the Board of Trustees, upon proper presentation to said Board, that such will facilitate the work of the Committee and contribute to the interest of the Association.

c. This Committee shall carefully check all magazines and journals publishing material of interest and reference to anesthesia and publish author, name of article, date and journal in the current issue of the Bulletin.

d. No paper shall be published in the

minutes or in any magazine or paper as a part of the transactions of this Association except with the approval of the Board of Trustees. All papers read at any session of the Association or its State or Sectional Asscoiations shall become the property of the Association, and when so requested, the Board of Trustees may cause same to be copyrighted in the name of the Board of Trustees; but unless prohibited by the Board of Trustees, the authors of all papers read at sessions of the Association or its State or Sectional Associations may cause the same to be published and if approved by the Board of Trustees, they may be published as a part of the transactions of the Association. No paper or magazine shall be entitled to the exclusive publication of any paper read before the Association or its sessions except by vote of the Board of Trustees.

Section 12. Legislative Committee.

a. All matters relating to State and National legislation, pertaining to the administration of anesthetics by Nurse Anesthetists, shall be referred to this Committee.

b. This Committee shall study the existing law of various states pertaining to administration of anesthetics by nurses and report and make recommendations to the Board of Trustees regarding any pending action.

c. The Executive Secretary shall be a member ex-officio of this Committee.

Section 13. Nominating Committee.

a. This Committee shall prepare a ballot for each Annual Meeting consisting of one or more active members for each office, qualified to hold office, and who have consented to serve if elected to the office for which they have been nominated.

b. On or before each February 1, preceding the Annual Meeting, this Committee shall issue to each State or Sectional Association a form on which the State or Sectional Association shall submit the name of one nominee for each office to be filled. This form shall be signed by the President or Secretary of the State or Sectional Association and be returned to the Committee on Nominations of the American Association of Nurse Anesthetists before May 1, preceding the Annual Meeting.

c. On or before June 1 of each year, the Committee on Nominations shall prepare from the list of names submitted, a ballot of one or more nominees for each office who are active members qualified to serve and who have expressed their willingness to serve if elected. If the names of nominees submitted by State or Sectional Associations do not meet the necessary qualifications, the Committee on Nominations shall have power to fill in names of nominees with the proper qualifications.

d. No names shall be presented to the Committee on Nominations or from the floor unless the nominee has consented and is free to serve if elected.

Section 14. Curriculum.

The work of this Committee shall include the study and presentation of the curriculum for Schools of Anesthesia and any other activity as approved by the Board of Trustees.

Section 15. Education.

The Committee on Education shall consist of not less than five (5) members. This Committee shall assist in the development of educational standards in accordance with plans approved by the Board of Trustees and such other educational projects as may be authorized by the Board of Trustees.

Section 16. Educational Exhibit.

The Educational Exhibit Committee shall be responsible for the educational exhibit booth at the Annual Meeting.

Section 17. Educational Correlating Committee.

The Chairman of the Curriculum Committee, Chairman of the Committee on Education and the Chairman of the Educational Exhibit Committee shall constitute the Educational Correlating Committee. This Committee shall correlate the work of the three Committees they represent and shall be responsible for the educational department in the official Bulletin.

Section 18. Program.

The Program Committee shall in conference with the President and Executive Secretary and with the approval of the Board of Trustees, prepare a complete program for the Annual Meeting. This Committee shall be responsible for all correspondence unless otherwise instructed and shall submit a draft of the program to the Executive Secretary not latter than May 15. At least thirty (30) days before issue of the August Bulletin, the Executive Secretary shall send to the Chairman of the Publishing Committee a copy of the official program.

Section 19. Convention Arrangements.

This Committee shall be responsible for the plans to be followed in carrying on the Annual Meeting by making arrangements for suitable places for general and committee meetings, hotel accommodations and general information, the Chairman if possible to be a resident of the city in which the Annual Meeting shall be held.

Section 20. Finance.

The Committee on Finance shall advise as to the expenditure of funds, prepare a budget of expense for each year and report same and all other matters of finance to the Board of Trustees. The Treasurer shall by virtue of her office, serve as a member of the Finance Committee.

Section 21. Trust Fund.

This Committee shall be composed of three (3) members, one of whom shall be the Treasurer. This Committee shall promote interest and secure contributions for the Trust Fund of the American Association of Nurse Anesthetists and be responsible that the rules and regulations are carried out as to the expenditure of the money in said Trust Fund.

Section 22. Executive Committee.

The President, First Vice-President, Treasurer and one other member of the Board of Trustees appointed by the Board at the Annual Meeting shall constitute an Executive Committee to act between meetings of the Board of Trustees. Action taken on such matters shall be ratified by the Board of Trustees. At least two meetings of the Executive Committee shall be held at Headquarters during the year and at such times as the development and needs of the Association indicate.

Article XVI

NOMINATIONS AND ELECTIONS

Section 1. All active members in good standing present at the regular Annual Meeting shall be entitled to vote at all elections of officers and trustees.

Section 2. No member whose dues have not been paid at the time of the Annual Meeting shall be entitled to vote at the Annual Meeting.

Section 3. Any member not in good standing May 1, next preceding an election, shall be ineligible to receive nomination for any office.

Section 4. No nominee shall be presented at any Annual Convention Meeting either by the Committee on Nominations or from the floor without a statement of her qualifications and her consent to serve if elected.

Section 5. Election shall be by ballot

if there is more than one (1) candidate for each office. If there is only one (1) nominee for each office, a plurality vote by voice, without ballot shall elect.

Article XVII
CONDUCT OF MEMBERS

If the conduct of any member shall appear to be in willful violation of the Articles of Incorporation and By-Laws of this Association, or prejudicial to the Association's interests, the Board of Trustees may, by the affirmative vote of two-thirds (2/3) of the entire Board, suspend or expel such member. Before taking such action, also a written copy of the charges must be served upon the member and an opportunity given to be heard before the Board of Trustees in defense. A motion to reconsider the suspension or expulsion of a member may be made at the next regular meeting of the Board of Trustees but not thereafter.

Article XVIII
AMENDMENTS

The Articles of Incorporation and By-Laws may be amended, modified or abolished at any Annual Convention Meeting by a two-thirds (2/3) vote of those present and qualified to vote provided notice of the proposed amendment, modifications or resolution for abolishment has been placed in the hands of the Executive Secretary, two (2) months prior to the Annual Meeting. Any such proposal to amend, abolish or modify shall be appended to the notice of the Annual Meeting of the Association.

Article XIX
PARLIAMENTARY AUTHORITY

Parliamentary Authority — "Robert's Rules of Order—Revised" shall be the authority for this Association, where not stated in the Articles of Incorporation or By-Laws.

Article XX
OFFICIAL ORGAN

The Bulletin of the American Association of Nurse Anesthetists shall be the official organ of this Organization.

STANDING RULES

The order of business at the Annual Meeting shall be:

Call to Order
Reading of Minutes
Roll Call
Reports of Officers
Reports of Special Committees
Reports of Standing Committees
Unfinished Business
New Business
Announcements
Program
Adjournment

RESOLUTIONS ADOPTED

"Resolution for Dissolution of the National Association of Nurse Anesthetists under the laws of the State of Ohio and the Desire to become Incorporated in the State of Illinois.

"*Whereas,* It has been found necessary to revise the present code of regulations to meet the needs of the Association; and

"*Whereas,* This would necessitate a change in the present Articles of Incorporation; and

"*Whereas,* The Articles of Incorporation in the State of Ohio, under which the National Association of Nurse Anesthetists is now incorporated, and the Articles of Incorporation in the State of Illinois have been reviewed; and

"*Whereas,* After careful investigation and consideration it was found that the Articles of Incorporation for corporations in Illinois are much more simple and less expensive than those of Ohio; and

"*Whereas,* Headquarters are now permanently located in Chicago, Illinois;

"Therefore, Be It

"RESOLVED, That the National Association of Nurse Anesthetists fill out certificate of dissolution in the State of Ohio and proceed to incorporate in the State of Illinois."

"Resolution to Change Name of National Association of Nurse Anesthetists.

"*Whereas,* We have decided by a unanimous vote to dissolve as the National Association of Nurse Anesthetists in the State of Ohio; and

"*Whereas,* Repeated requests and suggestions have been made to change the name of the National Association of Nurse Anesthetists to read as the American Association of Nurse Anesthetists; and

"*Whereas,* Our membership comes from other possessions than the United States; and

"*Whereas,* No Seal has yet been adopted for our national organization; and

"*Whereas,* The term 'National' is considered a common term applied to associations such as National Biscuit, National Casket, National Medical including Negro doctors and nurses;

"Therefore, Be It

"RESOLVED, That at this time we change the name of our organization from National Association of Nurse Anesthetists to American Association of Nurse Anesthetists."

"*Whereas,* The giving of anesthetics and the demonstration of anesthesia techniques by members of the National Association of Nurse Anesthetists in hospitals other than their own is not considered consistent with the policies of the National Association of Nurse Anesthetists; and

"*Whereas,* Criticism has been made concerning such procedures in the past;

"Therefore, Be It

"RESOLVED, That the National Association of Nurse Anesthetists recommend and adopt the following policy:

1. That the National Association of Nurse Anesthetists does not approve clinical demonstrations of any kind of anesthetic or any type of anesthesia technique by members of the National Association of Nurse Anesthetists who are not employed by the hospital where such demonstration is conducted.
2. That this policy shall apply to all members of the National Association of Nurse Anesthetists and to all State or Sectional associations affiliated with the National Association, at any meeting of a State, Sectional or National Association.
3. That the President of each State and Sectional Association be notified of this resolution;
4. That a copy of this resolution be published in the November, 1939, issue of the Bulletin of the National Association of Nurse Anesthetists."

Immediately after the adoption of the amended By-Laws the following resolution was presented and adopted:

Whereas, The Secretaries of all organized States were requested to send a copy of their By-Laws to Headquarters during the past year; and

Whereas, The By-Laws of the States do not conform in their entirety with the National By-Laws; and

Whereas, Amendments have been made in the National By-Laws and adopted;

Be it therefore

RESOLVED, That immediately following this Annual Meeting, a suggested form be drawn up to conform with the National By-Laws and a copy be sent to the Secretary of all State Associations requesting the State Revisions Committee to draw up a new set of By-Laws, to conform with the National and to be approved by the National Revisions Committee before adoption by the respective States.

Whereas, the Seventh Annual Convention of the National Association of Nurse Anesthetists meeting in Toronto, Ontario, September 25-29, 1939 inclusive, required extraordinary effort on the part of the Officers and Program Committee; and

Whereas, In the absence of a Local Arrangements Committee, much time and effort was given by our President, Miss Miriam Shupp, our Program Chairman, Miss Hazel Petersen and her co-worker, Miss Mabel Nichol, and

Whereas, Mr. Carl Flath, Chairman of Local Arrangements Committee, has given generously of his time and provided necessary facilities for our convenience; and

Whereas, A telegram was received from Miss Agatha C. Hodgins extending greetings and good wishes; and

Whereas, the Manager of the King Edward Hotel has cooperated and extended every courtesy to our organization; and

Whereas, Clinics arranged at

Toronto General Hospital, 101 College Street
Toronto Western Hospital, 399 Bathurst Street
Hospital for Sick Children, 67 College Street
St. Michael's Hospital, 30 Bond Street

have been provided for our edification; and

Whereas, The Executive Secretary, Miss Anna Willenborg, has made every effort possible to make the meeting a success in every particular; and

Whereas, We received inspiration and help from the speakers who so kindly appeared on our program;

Therefore, Be It

RESOLVED, That the members of the National Association of Nurse Anesthetists Convention assembled, express their sincere thanks and appreciation to all of the foregoing for their invaluable help and encouragement; and

That this Resolution be recorded in the proceedings of this Convention.

RESOLUTIONS COMMITTEE

Signed MARY C. BROWN
HAZEL BLANCHARD
HELEN ROBINSON

OFFICERS ELECTED

President—Miriam G. Shupp
Strong Memorial Hospital, Rochester, N. Y.

First Vice-President—
Sister M. Borromea Supplicka
St. Francis Hospital, Peoria, Ill.

Second Vice-President—L. Rose Littel
Minneapolis General Hospital, Minneapolis, Minn.

Treasurer—Gertrude L. Fife
University Hospitals, Cleveland, Ohio

Trustee (3-year)
Theresa A. McTurk
Metropolitan Hospital, Phila., Pa.

Sister M. Borromea Supplicka
First Vice-President

The next annual meeting will be held in Boston in September, 1940.

REGISTRATION LIST

Seventh Annual Meeting, Toronto, Canada

September 26-29, 1939

Bichel, Martha	Franklin Hospital	San Francisco, Cal.
Huntimer, W. Serena	500 Stanyan St.,	San Francisco, Cal.
Sr. M. Sylvester	Mt. San Rafael Hospital	Trinidad, Colo.
Brown, Mary C.	Jackson Memorial Hospital	Miami, Fla.
Watts, Marjorie Lee		Plant City, Fla.
Davis, Effie	Patterson Hospital	Cuthbert, Ga.
McDonald, Rosalie	Emory University Hospital	Emory University, Ga.
Cameron, Mae B.	Ravenswood Hospital 1919 Wilson Ave.,	Chicago, Ill.
Crane, Mrs. Katherine	St. John's Hospital	Springfield, Ill.
Cunningham, Helen R.	2105 E. 79th St.,	Chicago, Ill.
Dively, Mary V.	St. Mary's Hospital	Decatur, Ill.
Downham, Jane	Mother Cabrini Hospital	Chicago, Ill.
Lane, Maud	Englewood Hospital	Chicago, Ill.
Lewis, Hattie	St. John's Hospital	Springfield, Ill.

Nichol, Mabel	St. Joseph Hospital	Chicago, Ill.
O'Day, Exire	Ravenswood Hospital	Chicago, Ill.
Olson, Anna M.	Grant Hospital	Chicago, Ill.
Speers, Helen M.	Grant Hospital	Chicago, Ill.
Sr. M. Ambrose	Holy Cross Hospital	Chicago, Ill.
Sr. M. Borromea	St. Francis Hospital	Peoria, Ill.
Sr. M. Caroline	St. Francis Hospital	Peoria, Ill.
Sr. M. Corona	St. Francis Hospital	Peoria, Ill.
Sr. M. Raymonda	St. Anthony's Hospital	Rockford, Ill.
Vincent, Nelle	Evanston Hospital	Evanston, Ill.
Willenborg, Anna	18 E. Division St.,	Chicago, Ill.
Hane, Mrs. Ruth Hagen		Fort Wayne, Ind.
Kirschner, Regina R.	Marion General Hospital	Marion, Ind.
Lange, Agnes M.	326 Arcadia Ct.	Fort Wayne, Ind.
Vonderau, Anna M.	2902 Fairfield Ave.,	Fort Wayne, Ind.
Morgan, Velma Mae	1200 Main St.,	Dubuque, Ia.
Ruggles, Esther V.	Burlington Hospital	Burlington, Ia.
Schwarting, Louise	Lutheran Hospital	Fort Dodge, Ia.
Smith, Ethel	517 High Ave.,	Oskaloosa, Ia.
Mikkola, Senia I.	Wesley Hospital	Wichita, Kans.
Smith, Tommie		Louisville, Ky.
Koenig, Mary E.	Charity Hospital	New Orleans, La.
Myers, Esther	Charity Hospital	New Orleans, La.
MacFadden, Shamah M.	Leominster Hospital	Leominster, Mass.
Sutliff, Dorothy S.	Lowell General Hospital	Lowell, Mass.
Sr. M. Loreto	St. Vincent Hospital	Worcester, Mass.
Bradbury, Nelle	Cottage Hospital	Grosse Pointe, Mich.
Cotè, Angela B.	Mercy Hospital	Muskegon, Mich.
Courtney, Mabel E.	Grace Hospital	Detroit, Mich.
Fletcher, Mamie J.	Receiving Hospital	Detroit, Mich.
Hazzard, Mary M.	Gerber Memorial Hospital	Fremont, Mich.
Hopkins, Ida M.	Charles Godwin Jennings Hosp.	Detroit, Mich.
Howard, Florence C.	Woman's Hospital	Detroit, Mich.
Huffman, Annie	Delray General Hospital	Detroit, Mich.
McGarrey, Mary	Mercy Hospital	Bay City, Mich.
Meil, Esther	Henry Ford Hospital	Detroit, Mich.
Myers, Gertrude M.	St. Mary's Hospital	Detroit, Mich.
Shuff, Frances	Seymour Hospital	Eloise, Mich.
Sr. Clara Behnke	Evangelical Deaconess Hospital	Detroit, Mich.
Weigand, Marion	406 W. 11th	Traverse City, Mich
Anderson, Alice L.	Minneapolis Gen'l Hospital	Minneapolis, Minn.
Gaertner, Elizabeth	St. Mary's Hospital	Minneapolis, Minn.
Grebstad, Borghild	Northwestern Hospital	Minneapolis, Minn.
Petersen, Hazel	Fairview Hospital	Minneapolis, Minn.
Vandervelde, Clara	St. Barnabas Hospital	Minneapolis, Minn.
Westley, Grethe	Deaconess Hospital	Minneapolis, Minn.
Davis, Willie Lee		Vicksburg, Miss.
Lamb, Helen	Barnes Hospital	St. Louis, Mo.
Slasor, Zelle	1400 Professional Bldg.	Kansas City, Mo
Nelson, Leona	Methodist Hospital	Omaha, Nebr.
Aberg, Harriet L.	Muhlenberg Hospital	Plainfield, N. J.
Calden, Mary L.	Hospital for Crippled Children	Newark, N. J.
Logan, Della	Cooper Hospital	Camden, N. J.
Loyd, Belle	Overlook Hospital	Summit, N. J.
Rauffenbart, Mary	Cooper Hospital	Camden, N. J.

Blanchard, Hazel	1910 7th Ave.,	Troy, N.Y.
Craven, Helen K.	New York City Hospital	New York, N. Y.
Dougherty, Donna	Wilson Memorial Hospital	Johnson City, N. Y.
Gallon, Martha	Coney Island Hospital	Brooklyn, N. Y.
Hess, Mrs. Frances	Long Island College Hosp.	Brooklyn, N. Y.
McCoy, Charlotte R.	1320 York Ave.,	New York, N. Y.
McKay, Cora	Albany Hospital	Albany, N. Y.
Satterlee, Charlotte D.	Memorial Hospital	Albany, N. Y.
Shupp, Miriam G.	Strong Memorial Hospital	Rochester, N. Y.
Silverman, Mrs. Helen M.	8801 Shore Rd.,	Brooklyn, N. Y.
Smith, Alice C.	Prospect Heights Hospital	Brooklyn, N. Y.
Weaver, Edith R.	Hudson City Hospital	Hudson, N. Y.
Scarborough, Monte	Presbyterian Hospital	Charlotte, N. C.
Winters, Ella A.	St. Luke's Hospital	Fargo, N. D.
Barth, Alice L.	Younsgtown Hospital	Youngstown, O.
Carpenter, Grace	Children's Hospital	Cincinnati, O.
Dickerson, Mrs. Ann	1601 Mars Ave.,	Lakewood, O.
Fife, Gertrude L.	University Hospitals	Cleveland, O.
Graff, Ruth	University Hospitals	Cleveland, O.
Kaiser, Emilie	University Hospital	Columbus, O.
Pfeifer, Christine	Children's Hospital	Columbus, O.
Richards, Lucy E.	City Hospital	Cleveland, O.
Van Arsdale, Mrs. Myra	St. Luke's Hospital	Cleveland, O.
Weber, Lillian	Women's & Children's Hospital	Toledo, O.
Feser, Anne C.	308 Medical Dental Bldg.	Portland, Ore.
Feser, Rose	1205 Milwaukie	Portland, Ore.
Abary, Edith E.	Harrisburg Hospital	Harrisburg, Pa.
Duffield, Caroline I.	Butler Co. Memorial Hospital	Butler, Pa.
Emerick, Ida M.	Rochester General Hospital	Rochester, Pa.
Gagliardi, Katherine F.	Lankenau Hospital	Philadelphia, Pa.
Knicely, Helena	Oil City Gen'l Hospital	Oil City, Pa.
McTurk, Mrs. Theresa A.	1903 Green St.,	Philadelphia, Pa.
Morris, Alice P.	Buhl Hospital	Sharon, Pa.
Salomon, Hilda R.	Jewish Hospital	Philadelphia, Pa.
Strayer, Mary C.	1165 Miles St.,	Johnstown, Pa.
Suter, Magdalene	Girard College	Philadelphia, Pa.
Sr. Theodore Hale	St. John's General Hospital	Pittsburgh, Pa.
Walton, Mary E.	Mercy Hospital	Pittsburgh, Pa.
Adcock, Alice	Columbia Hospital	Columbia, S. C.
Hinnart, Frances	1427 Pickens St.,	Columbia, S. C.
Verner, Lucy P.	1319 Bull St.,	Columbia, S. C.
Hobson, Archie D.	Fort Sanders Hospital	Knoxville, Tenn.
McEvoy, Jean	1914 Grand Ave.,	Nashville, Tenn.
Sharpe, Martiel	Rutherford Hospital	Murfreesboro, Tenn.
Vickers, Hattie	Vanderbilt University Hospital	Nashville, Tenn.
Hoadley, Dorothy	Harris Mem. Methodist Hosp.	Fort Worth, Tex.
Richardson, Grace	2624 Greene Ave.,	Dallas, Tex.
MacGregor, Elizabeth	Alexandria Hospital	Alexandria, Va.
Massie, Cora E.	Grace Hospital	Richmond, Va.
Payne, Minnie Freese	University of Virginia Hosp.	Charlottesville, Va.
Supinger, Virginia	Dixie Hospital	Hampton, Va.
Ward, Eloise C.	Norfolk Gen'l Hospital	Norfolk, Va.
Koski, Elsa A.	Tacoma General Hospital	Tacoma, Wash.
Mayer, Margott	Deaconess Hospital	Wenatchee, Wash.
Roberts, June C.	Sacred Heart Hospital	Spokane, Wash.
Robinson, Helen E.	Avalon Hotel	Spokane, Wash.

Cameron, Catherine	St. Joseph Hospital	Milwaukee, Wis.
Campbell, Julia	Evangelical Deaconess Hospital	Milwaukee, Wis.
Harkins, Catherine W.	Milwaukee County Hospital	Milwaukee, Wis.
Yanulis, Mary Ann	Beloit Municipal Hospital	Beloit, Wis.
Derwae, Lillian	Memorial Hospital	Rawlins, Wyo.
Sinclair, Jennie M.	Chipman Memorial Hospital	St. Stephens, Canada

JOINT LUNCHEON ALUMNAE ASSOCIATIONS

As President of the Lakeside Alumnae Association I am glad to be here today and to extend greetings to the members of the alumnae of the Schools of Anesthesia of the Jewish Hospital of Philadelphia and the Long Island College Hospital of Brooklyn, as well as to fellow members of the Lakeside Association who are in attendance at this meeting. A hearty welcome is also extended to our guests and we hope you will join us in future gatherings of this nature.

I hope that each year will find with us other groups constituting representation from additional School of Anesthesia Alumnae Associations. These graduate bodies provide a background of interest and help without which the Schools of Anesthesia would accomplish far less. If each graduate is faithful to the traditions and spirit of the school from which she was graduated, her influence and example in the hospital and community where she is employed will reflect honor and credit upon the school and the profession, and will tend to build up the faith of both professional and lay people with whom she comes in contact, in the ability of the nurse anesthetist to give conscientious and efficient service in this special field.

I am sure the reports of the activities of these schools which will be given by the Directors, will be of interest to all of us and will stir each of our groups to emulation, so that every year will mark a milestone of substantial progress for each individual school. The mental stimulation afforded by these annual meetings is a valuable factor in our field, and since the inception of these yearly conferences we realize that it is indeed high time we are functioning as organizations for the good of the work.

MYRA VAN ARSDALE

REPORTS—SCHOOLS OF ANESTHESIA

Jewish Hospital School of Anesthesia, Philadelphia

The Alumnae Association of the Jewish Hospital School of Anesthesia expresses its appreciation for the opportunity to meet with this group. Our Alumnae Association was organized less than one year ago, on December 13, 1938. At this first meeting, officers were elected and various committees appointed. Dr. Louis Zisserman, Director of the School of Anesthesia and Miss Hilda Salomon, Chief Anesthetist and Instructor, were present and acted in an advisory capacity.

In consideration of the distance separating the various members, it was decided to hold our meetings semi-annually, in May and November. Dues are one dollar per year, and of the sixty-three graduates, forty are now members of the Alumnae Association.

The officers for the year 1938-1939 are as follows:

President—Alice C. Smith.
Vice-President—Dorothy Wright
Secretary-Treasurer—Bessye Kolker.

Miss Salomon was elected Honorary President. Graduates are now located in Alabama, Arkansas, California, the District of Columbia, Florida, Kansas, Missouri, New Jersey, New York, North Carolina, and Pennsylvania.

It is the hope of this Alumnae Association that the future will bring much progress, and build a closer relationship with one another in our school and with the State Association and the American Association of Nurse Anesthetists.

BESSYE KOLKER, Secretary

Long Island College School of Anesthesia, Brooklyn, N. Y.

At the present time six anesthetists a year are trained at Long Island College Hospital. Field trips are arranged, including visits to plants manufacturing the various anesthetic gases and to hospitals to observe anesthetic methods and equipment.

In the past year we have offered post-graduate courses to anesthetists who have been graduated from recognized Schools of Anesthesia—a seven weeks' course for those wishing to bring themselves up to date on the newer anesthetic agents and methods and also a two or three weeks' course in cyclopropane for anesthetists who are employed and are familiar with the soda lime absorber. As these courses are given only as the surgical schedules permit, we have many more requests than we can fill.

The Alumnae Association was re-organized in 1937 and meets every second month, at which time guest speakers are invited. Detailed reports of all New York State and National Association conventions have been given at these meetings. Next March our School of Anesthesia will celebrate its twenty-fifth anniversary by holding a reunion dinner.

A number of requests from graduates of other Schools of Anesthesia to be permitted to attend our Alumnae meetings have been received and at the May, 1938 meeting, graduates of other Schools of Anesthesia, who are members of the National Association of Nurse Anesthetists and living in the vicinity of Greater New York, were welcomed to our Alumnae meetings with all the privileges of our own group except the right to hold office.

FRANCES HESS

University Hospitals of Cleveland School of Anesthesia

It is indeed a pleasure to have the privilege of presenting at each annual meeting of the Alumnae Association a report of the activities of the school. During the year beginning September 1, 1938, and ending August 31, 1939, fourteen anesthetists have been graduated.

The following books and educational equipment have been donated during the past year:

	Presented by:
"Triumph Over Pain" by René Fülöp-Miller - - -	Esther Pracejus
"Physiology of Anesthesia," Henry K. Beecher (three copies) -	Myrtle G. Hopkins Ruth L. Davis Janet McMahon
"Curriculum Guide for Schools of Nursing," published by National League of Nursing Education - - -	Winifred Rose
"On the Technique of Pneumonectomy in Man" Clarence Crafoord -	Mary Lou Aultman
"Anesthesia Abstracts, Volume VI, Journal Club, Section on Anesthesia, Mayo Clinic - - -	Mary Lou Aultman
ditto, Volume VII - - - - - - - - - - -	Louise Wells
Five drawings of intratracheal technique	Drawings donated by the Alumnae Association; framing by Melva Marie Rockwood

Separate copies of the following periodicals were also purchased containing articles on anesthesia of especial interest:

California and Western Medicine	November 1931
New England Journal of Medicine	May 5, 1938
Journal American Medical Association	March 19, 1939
Surgery, Gynecology and Obstetrics	December 1906
Ditto—	April 1939

As of August 31, 1939, there is a balance in the library fund of $23.79, including recent gifts from the following:

Anna Katharine Grant
Margaret A. Duffy

Last year the Alumnae Association voted $100.00 as a contribution toward research work in anesthesia at the University Hospitals. This money was used in the development by Dr. Frederick Mautz of a respirator which is being used at the University Hospitals of Cleveland. In my opinion this piece of apparatus is an outstanding contribution to the field of anesthesia and I believe will eventually be a recognized part of standard anesthesia equipment.

The present course of world events brings to our minds the fact that the School of Anesthesia numbers among its alumnae missionary nurses in the following fields:

Evva Pauline Hartig - - - - -	India
Thekla Hoffman - - - - -	India
Florence E. Schafer - - - - -	India
Jean Lawson - - - - - -	Mexico
Florence Fox - - -	Philippine Islands
Myra L. Sawyer - - - - -	China

Other graduates abroad include:

Anne Savage	Canal Zone
Grace Wetzel	Dutch West Indies
Marie Therese Dubalen	France
Rose C. Barton	Hawaii
Julia M. Dumenda	Hawaii
Frances Gibson	Hawaii
Ann M. Koshel	Hawaii

In Canada:

Jennie M. Sinclair	New Brunswick
Bessie Moffatt	New Brunswick

Miss Persia Phelps, who was graduated on May 1st, expects reappointment to India in the fall of 1940. Miss Ella Foerstel did observation work in the school during the summer and returned to St. Luke's Hospital, Tokyo, Japan. We are sure that all the anesthetists we have mentioned will give a good account of themselves wherever they may chance to be during these stirring times.

We appreciate the interest various members have taken in the school during the past year. Our alumnae members, as always, have helped our new graduates in their first positions and have taken a keen interest in their welfare; and as previously mentioned, the graduates have cooperated splendidly in building up the school library.

I believe the members of the Lakeside Alumnae Association will agree with me when I state that there has always been manifest among the graduates of the Lakeside School peculiarly close ties of interest, fellowship and desire to do all possible to help the school and the classmates with whom they have spent so many busy and happy hours. I have no doubt but that this experience is shared by the members of the other alumnae groups present with us today. The comparatively small size of our group and the special sense of responsibility developed in this field, which has become a part of our very being, sets us apart in a special way from any other group of women in the nursing world. This highly sensitized "conscience," shall I call it, was in reality the urge behind the decision to organize both this Alumnae Association and the National Association of Nurse Anesthetists, and I feel that our contacts in these annual meetings strengthen both our ability and our intensity of purpose to carry out the objectives of our schools and of our National and State organizations.

GERTRUDE L. FIFE

THE CHOICE OF ANESTHESIA IN GASTRO-INTESTINAL SURGERY

ARTHUR W. ALLEN, M.D.

Department of Surgery, Massachusetts General Hospital
Boston, Mass.

Read before the Mid-South Post Graduate Nurse Anesthetists' Assembly, held in Memphis, Tenn., February 15-16, 1939.

In discussing this subject, one must take into consideration a great many general factors. In the first place, the surgeon must know what his patient can stand and also, he must know what his anesthetist can accomplish. It is not possible to set down any definite rules that all may follow. My remarks, therefore, will not be specific but based on my own experience in a large general hospital. I fully realize that many types of anesthesia, found satisfactory to other surgeons of wide experience, are not to be condemned. Each surgeon and anesthetist must work out for themselves the best arrangement possible for the safety of their patient. We must consider the age and condition of the patient, the lesion with which we are dealing, the length and severity of the operation, and the conditions under which we must work. It is not safe to apply any general rules to any group of diseases or lesions. One may vary the choice of anesthesia, depending more on the condition of the patient than on the type of lesion.

In the first place, the safety of the patient far outweighs all other considerations. It does not matter how smoothly an anesthetic is given or how beautifully the operation is done, if the end-result is a long, stormy convalescence or death. Thus, in the young good-risk patient in zones particularly free from pulmonary complications, one may use a general anesthetic with safety on practically all intra-abdominal lesions. On the other hand, in areas where pulmonary complications are common—such as the Atlantic seaboard, for instance, with which I am particularly familiar, one cannot during the peak of upper respiratory tract infections administer general anesthesia to patients with quite the same safety as local, regional, or even spinal. There has been some statistical evidence supporting the contention that pulmonary complications follow the use of local and spinal as frequently as inhalation anesthesia. This we doubt, and feel that in the group analysed local and spinal were used in the poorer risk patients.

The second great consideration is the comfort of the patient. In speaking of comfort, one must be sure whatever method of anesthesia one chooses that the anesthesia is really satisfactory from the patient's standpoint. One should remember the possibilities of the psychic trauma of local anesthesia in some patients as well as to be sure that his local or spinal is completely effective. Many patients, however, so loathe to lose consciousness that they are willing to accept almost any means rather than to breathe an anesthetic agent. One should pay a good deal of attention to this factor because I believe a few patients have failed to survive an operative procedure due to the fact that they went under their anesthetic with mortal fear of never awakening. It is probable that pa-

tients cannot actually will themselves to die, but I do believe that the question of fear is a very important one and should be combatted by every known means. One must also take into account the comfort of the patient on the table. This is important whether the anesthesia is general or local, since in the former it eliminates many postoperative discomforts and in the latter it helps him to bear with equanimity a trying ordeal. The table must be well padded, preferably by sponge rubber; his head should be at a comfortable level. A pillow under the knees will relieve the strain on his back and leg muscles and at the same time increase the relaxation of the abdominal muscles. Too much covering must be avoided if the room is hot, and a gently blowing fan protected by a head sheet will add to his comfort.

The third chief consideration is that the surgeon must be unhampered. It is necessary that he be allowed to accomplish what he sets forth to do without having to struggle with the patient or the patient's viscera during the operation. Too frequently, an operation of magnitude is started with inadequate anesthesia and then, the surgeon finds himself struggling against the involuntary motions of the patient in a manner which not only hampers the surgeon but adds materially to the risk of the operation. It often means the use of strong retraction of the abdominal wall or the replacing of gauze packs against the intestines at intervals. These insults to the tissues of the patient are highly undesirable and often cause serious and unnecessary complications. These factors often far outweigh any good that may come from any one form of anesthesia chosen over another. In intra-abdominal lesions, above all others, the surgeon must have relaxation of the muscles; there should be no straining on the part of the patient, either from vomiting or from other reflex involuntary movements.

Local Anesthesia. Novocaine infiltration lends itself admirably to certain forms of abdominal surgery. The best example of this is the repair of inguinal hernia—here, one may expect to get complete anesthesia by a proper local infiltration or field block so that the patient has no discomfort, the surgeon is unhampered, and the operation can proceed in the same orderly fashion that may take place with the use of general anesthesia. This should not limit the surgeon in his choice of procedure as to the repair of such a hernia. It might be unwise to undertake certain types of hernia repair under a local infiltration or even local block, since secondary operations in the inguinal regions, hernia in scar, and large sliding hernia may require multiple incisions or the use of fascia lata in their repair. However, spinal anesthesia may offer many advantages in such cases. Local has particular value in doing minor procedures on the very ill patients—such as enterostomy and cecostomy for intestinal obstruction, and cholecystotomy for certain types of acute gallbladder disease. In the patient with acute intestinal obstruction, one never should use a general anesthetic inasmuch as vomiting is apt to occur and the patient may aspirate some of his vomitus in spite of the greatest care on the part of the anesthetist. This is very apt to take place during the stage of induction at a time when the anesthetist has the least control over the situation; for this reason, intestinal obstruction should always be dealt with either under local or, if patient is not too ill, under spinal anesthesia. One should not use spinal in the very ill patient with intestinal obstruction because there may be an

added fall in blood pressure which may prove fatal on the table. Therefore, if the patient is in very poor condition, having been obstructed for a matter of days or in the case of a high obstruction for a matter of hours, one should then do the enterostomy necessary to relieve the obstruction under local anesthesia alone. Fortunately, in the present treatment of intestinal obstruction by suction through an inlying tube within the stomach or intestine, one rarely has to operate upon a patient so ill that spinal anesthesia cannot be used.

Ogilvie (Fig. 1) has recently reported a technique of local anesthesia for gas-

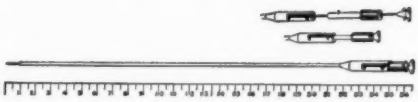


Fig. 1

trectomy.[1] A very extensive abdominal block (Fig. 2) is made with half per cent novocaine and one-fourth per

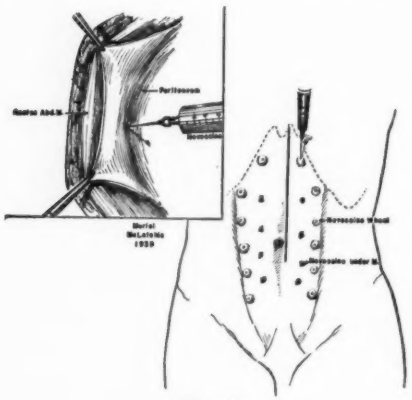


Fig. 2

cent quinine and urea. After opening the abdominal wall, (Fig. 3) sixty cc. of one per cent novocaine and one-fourth per cent of quinine and urea is injected into the splanchnic area through a special needle. In addition to this, some novocaine is put along the vessels of the lesser and greater curvature of the stomach and also in the region of the superior mesenteric vessels.

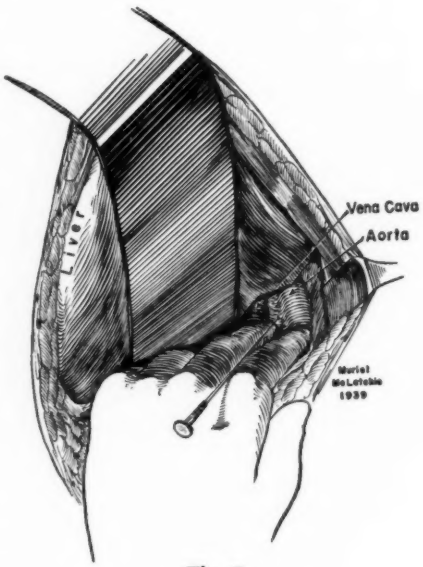


Fig. 3

I have tried this method of anesthesia in approximately thirty cases and have found it very effective. My only difficulty with the method has come in having to change to a general anesthetic if the resection has to include the lower end of the esophagus; here, in spite of novocaine injected along the vagus nerves which should be done routinely in total gastrectomy, one finds that the necessary pull on the esophagus is very uncomfortable for the patient. Therefore, when total gastrectomy is contemplated, an intratracheal inhalation anesthesia is best. It is surprising, however, how well a subtotal gastrectomy can be done under Ogilvie's technique alone. We have had some difficulty in closing the abdominal incision following this method but by

reinfiltrating the abdominal wall, this can be accomplished without too much difficulty.

Spinal anesthesia is particularly well suited for the good-risk patient whose blood pressure is not too high for the operations of hernia, appendicitis, and bowel resection. It is by far the wisest type of anesthetic agent to use in acute appendicitis; here, one does not want to spread infection to uninfected areas of the abdominal cavity and for this reason, spinal anesthesia gives the best relaxation, allows the least manipulation of the intestine, and is completely comfortable from the standpoint of the patient. In large bowel resections, I like spinal anesthesia better than any other for many reasons. One is the frequency of pulmonary complications in our section of the country following this serious operation. Other reasons are the type of lesion with which we are dealing, the depleted state of the patient, and the need for a maximum diminution in the size of the intestine.

Therefore, even if the risk may be a little greater in some instances, one may choose spinal anesthesia and feel that its disadvantages may be offset by the increased ease with which the operation can be done. The better exposure that this allows, aids in the more radical removal of the lymph node area associated with the growth and reduces the necessary trauma to other structures within the abdomen. In operating for malignant lesions of the large bowel, one finds two areas that are not quite anesthetized by the average spinal anesthesia—these are the hepatic and the splenic flexures. In some instances, it is wise to add a small amount of gas-oxygen anesthesia while the flexures are being freed from their attachments. As to the anesthetic agent used for spinal for short operations, novocaine crystals are satisfactory and should be used because of their low toxicity. For longer operations, one should use pontocaine with a small amount of novocaine added. Nupercaine may be used but we have been a little cautious about it and have had no extensive experience with it so far. It seems to be more toxic than the other agents but is being extensively used in some clinics in a dilution of 1 to 1500. We realize that pontocaine is more toxic than novocaine but if it is given in proper strengths and proper amounts, preceded by a suitable amount of ephedrine, one may carry a poor-risk patient through a rather long and tedious operation with safety.

I have not used spinal anesthesia for gallbladder and stomach work to any great extent, feeling that high anesthesia in poor-risk patients may be obtained more safely by some of the other methods at our disposal. This may not be true in dealing with the gallbladder and extra-hepatic ducts; on the other hand, the operations which I have done under spinal for these lesions have not been as uniformly successful as those done under a general inhalation anesthesia. I have seen a great many men of wide experience use spinal anesthesia for gallbladder and common duct work, also for gastrectomy. I am quite sure that we might feel more confidence in this method had our experience with it in the past been more satisfactory. It is possible that with further development of this type of anesthesia, we will like it better.

General Anesthesia. By far the most satisfactory general anesthetic in our experience has been a combination of nitrous oxide, oxygen and ether, given in a closed machine. In patients who are going to have upper abdominal operations or intestinal resections under this method, we prefer intratracheal

anesthesia. It is also a very important type of anesthesia in repairing diaphragmatic hernia. Here particularly and often in total gastrectomy, one may wish to have positive pressure applied and it can be very effectively done by this method; also, it has the advantage of having the patient under complete control at all times. One may say that intratracheal anesthesia would give a higher percentage of pulmonary complications than inhalation methods without the tube introduced into the trachea. That this tube is a foreign body and will cause irritation to the cells of the trachea and to the larynx, one cannot deny, and we have had some pulmonary complications following its use. I am quite sure, however, that the percentage of pulmonary complications following the use of intratracheal anesthesia, in the very serious types of operations in which we have used it, has not been any greater than when straight inhalation anesthesia was used. Nor have these complications been any more severe. I am quite convinced that the advantages of this method far outweigh its disadvantages in many instances.

I think one should not overlook the fact that local anesthesia or even spinal anesthesia, plus simple inhalation of nitrous oxide and oxygen, has a great place in abdominal surgery. This is particularly true where the diathermy machine or the cautery will be used. When one adds ether to the mixture, one is then handicapped in the use of these instruments which are so valuable, particularly in dealing with infected carcinoma of the stomach or in division of the bowel for cancer.

Ethylene and Cyclopropane, although very superior gases from the standpoint of anesthesia, are in my opinion too dangerous to use in a general operating room where students, visiting doctors, and nurses are constantly coming and going. In the early days of ethylene, we had at the Massachusetts General Hospital three minor explosions, none of which was particularly disastrous—no one was killed and no one seriously hurt. This caused us to feel, however, that it was potentially too dangerous to use in the general hospital as it exists today. When cyclopropane came along, we felt that perhaps we had a much safer agent and welcomed it because we realized its superiority from the standpoint of relaxation and low toxicity. In spite of the high oxygen concentration that could be used with cyclopropane, however, one cannot overlook the fact that it is extremely explosive. It absolutely precludes the safe use of the cautery or the diathermy machine, and there have been fatal explosions from static spark during operations where no electrical apparatus was in use and under conditions that seemed ideal. Therefore, I think we must be prepared to use this agent very guardedly. We must find that its dangers are sufficiently offset by its value from the standpoint of the patient and the surgeon and not use it except in certain types of cases where it has such outstanding advantages over other types of anesthesia that one can afford to take some risk with it. I think it is likely that all of the conditions necessary to make the use of cyclopropane and ethylene safe will eventually be met and its use become more general.

Avertin Anesthesia. I do not feel that I should omit mentioning avertin anesthesia because it is in fairly general use throughout the country and has proved a great boon in neurosurgery. Without a doubt, it is the anesthetic of choice in many operations within the cranium. I feel, however, that in practically every other branch

of surgery, with the possible exception of surgery in children, that avertin can be replaced by safer anesthetic agents. Beecher at the Massachusetts General Hospital found that avertin was more dangerous than any other agent we had used.[2] Its use, which rose to a high peak in 1936, has gradually come down to being almost excluded in our hospital except for neurosurgical operations. I must say that I have been greatly impressed with the elimination of the psychic trauma in children by the use of avertin, and I have seen no ill effects from it in any single child in which it has been used. In adolescence and adults, however, I think one should accept its toxicity and discard it for safer measures.

Preoperative Medication. I am at a loss to explain how patients can tolerate so many different kinds of drugs and am amazed to find many of the usual narcotics being given to one patient prior to operation. I feel that it is wiser to try out various drugs on a patient, who is going to have an operation of election, and find out how well they tolerate and respond to these drugs so that the proper one and dosage may be selected for the individual. We have found this to be of great value particularly in medicating patients with hyperthyroidism prior to operation. If one has any major procedure to do on a patient and he wants to be sure that the preoperative medication is suitable for that individual, this trial method prior to operation seems to us a very wise precaution. The drugs which we have found most useful in recent years have been nembutal followed by a small dose of morphine. The average patient is given a grain and a half of nembutal at bedtime, the night before operation, and three grains of nembutal two hours before operation; this is followed by a hypodermic of one-sixth of morphia and a hundred and fiftieth of atrophine one-half hour before operation. Unless the patient is excitable or has an idiosyncrasy to one of these drugs, he is apt to come to the operating room in a quiet state of mind, and many such patients do not remember having had the inhalation anesthetic started. On the other hand, if by trial we find that a patient is particularly resistant to nembutal or to morphia, we are apt to try him out on scopolamine and morphia before operation. Although by and large, our results have never been as good with scopolamine and morphine as they have been with nembutal and morphine. In the patient we have not had the opportunity to test beforehand, we are apt to use a combination of nembutal and morphine as we have described. Whatever premedication one uses, if the patient is to have an inhalation anesthetic, certainly we do not wish to depress the respiration to the point where the anesthetist has difficulty in getting the patient to breathe a sufficient amount of the anesthetic agent to produce narcosis. Also, I think it is wise to heed a patient's known experience in the use of drugs. It is not uncommon to have a patient tell the surgeon or the anesthetist that he cannot take morphia because it always produces nausea; others maintain it produces wakefulness or excitability. It has been my experience that when a patient makes such a statement it is wise to use some other drug. In preparing a patient for operation under local anesthesia, we prefer two-thirds grain of pantopon given hypodermically one hour prior to operation.

In conclusion, I will sum up these wandering remarks on the choice of anesthesia in gastrointestinal surgery as follows:

In the first place, we must strive to

have a living patient at the end of the operation and one who may be discharged from the hospital in good condition, free of his disease, and in a reasonable number of postoperative days. We hope this patient will have gone through his operation without having any terrible memories of the experience. This means proper sedation prior to local and spinal anesthesia and the correct psychic approach by the anesthetist and by the surgeon prior to operation. These will eliminate many of the unpleasant memories which stand out so graphically in the minds of many patients who have undergone serious operations. It is necessary that the surgeon be unhampered, that his work is not curtailed by an imperfect anesthesia or a patient who does poorly under the type of anesthesia which has been chosen for him. In avoiding this, one must take into consideration the lesion with which one is dealing, the age and condition of the patient in choosing the anesthesia best suited for that particular operation in that particular patient. Next, we are interested in choosing the type of anesthesia which gives us the minimum of postoperative complications. We do not want our patient to have intestinal obstruction after operation due to rough handling of the intestines, or the leaving of traps in the mesentery due to being hurried because the patient is doing poorly under the anesthetic. We do not wish our patient to have excessive postoperative vomiting; this could be handled largely by the use of an inlying Levine tube after operation, but much of it has to do with the type and manner in which the anesthetic agent has been given. Most of all, we do not wish our patients to have a postoperative pulmonary collapse or pneumonia. This may be guarded against by a careful aspiration of the trachea immediately at the end of the operation, by the administration of carbon dioxide and oxygen after the operation and by important postoperative nursing instructions. If these factors are all borne in mind, we will have a great many more successful outcomes in the group of patients subjected to abdominal operations. Last of all, it is necessary to have complete cooperation between the anesthetist and the surgeon.

BIBLIOGRAPHY

1. Ogilvie, W. H.: Carcinoma of the Stomach; Surgery, Gynecology & Obstetrics, Feb. 15, 1939.
2. Beecher, Henry K.: Fatal Toxic Reactions Associated with Tribromethanol Anesthesia; J. A. M. A. 1938. Vol. III, Pg. 122.

THE PREVENTION OF ANESTHETIC EXPLOSIONS

WARREN P. MORRILL, M.D.

American Hospital Association

Chicago, Ill.

Read at the seventh annual meeting of the National Association of Nurse Anesthetists, held in Toronto, Canada, September 26-29, 1939.

The dramatic and sometimes fatal results of anesthetic explosions have attracted to them an interest out of all proportion to their frequency and danger. But the fact remains that the hazards do exist, occasional lives are lost, and that the vast majority of these explosions need not occur if certain

easily understood precautions are taken.

Any attempt to avoid the hazards of anesthetic explosions must be predicated on an understanding of the physical characteristics of the anesthetic agents themselves and of the possible sources of ignition of these agents. Once these two sets of data are understood the precautions necessary follow in logical sequence.

Without going into detailed scientific data, it may be said that ethylene and cyclopropane in combination with oxygen are inflammable in all concentrations used for anesthesia. This applies to the concentration as it exists in the bag, and in the tube and mask to the patient's face. Theoretically dilution takes place in proportion to the cubic space through which the gas is dispersed. Thus the concentration at three inches from the point of exit of the gas would be but one twenty-seventh as great as at one inch from the point of exit and at one foot would be as 1 to 1728. This rapid dilution rate provides a physical background for the recent statement of Professor Horton: "It is safe to assume that no explosive mixture can exist outside a region of something like a foot in radius surrounding any gas leak." Any presumption that a stray draft of air may carry a current of gas in explosive concentration to any material distance from the point of leak is based on the assumption of physical characteristics of gases which rarely exist and could be created by only the most extraordinary conditions of air movement which would be instantly recognized on account of the high velocity of air involved.

Using the density of air as 1.0, the density of ethylene is 0.97, of cyclopropane is 1.45 and of ether is 2.56. On account of being heavier than air it is apparent that cyclopropane and ether will tend to sink toward the floor, while ethylene is so near the same density as air that it will float freely and move in whatever direction the general air currents of the room are moving. This results in the possibility that in an exceptionally poorly ventilated room, exhaled or leaking gases might conceivably collect in explosive concentration at some point in the room below the level of the operating table. Since such lack of ventilation would involve tightly sealed windows and doors and lack of mechanical ventilation, and would make the general atmosphere of the room very oppressive, it is difficult to conceive that it would be permitted to exist. The possibility of such a concentration is, however, the probable background of a recent insurance inspector's report: "Raise the two wall outlet boxes in operating and delivery rooms to the level of the light switches or replace present boxes with explosion proof fittings."

That the results in practice agree with these theoretical considerations is well borne out in a recent report of 102 fires and explosions in which the point of occurrence of the explosion was in no case located more than a few inches above the level of the patient's face, though six reported the cause as "open flame," five as "spark from motor," one as "spark from lamp socket," one as "electric plug pulled from wall," and one as "turning on light" which might conceivably have been somewhat remote from the mask area, but quite as probably in the zone below the level of the patient.

Before the introduction of the newer gaseous anesthetics, ethylene and cyclopropane, ether or nitrous oxide was almost universally used. The fact that so little was heard about anesthetic explosions during the ether era might suggest that it was not a particular hazard. But in the report of 102 explosions above referred to, 48 occurred

during the use of ether, either alone or in combination with oxygen or nitrous oxide and oxygen. One explanation of this is probably that there are some reports which antedate the general use of the gaseous anesthetics. There have not been sufficient statistical studies made which would permit a sound conclusion as to the relative incidence of explosions per thousand administrations, that is, the relative safety of the various anesthetics under practical conditions.

There is little doubt that under the conditions normally present in the absorption method now generally used, no explosive concentration of the gases can ever exist at any part of the cycle beyond the mask and that the precautions against explosive concentrations will be limited to the immediate vicinity of the tanks, machines and their appurtenances. In the case of ether given by the open drop method there does exist the possibility of an explosive concentration at the mask and at the can and, in case of poor ventilation, it is possible to conceive of an explosive concentration in the lower levels of the room—as five cases reported as due to "spark from motor" would suggest—though the reports do not state whether the motors concerned were compressor motors on the anesthetic table or on the floor, or bone saw motors which might conceivably have been quite close to the patient's face. In any case they would have been below the level of the patient's face, and they might have been very close to the ether supply itself.

But just as it takes two to make a bargain it takes two conditions to produce a fire, and an explosion is merely a fire spreading so rapidly that the heated gases expand more rapidly than they can escape. The two elements necessary are first, an explosive concentration of flammable gases, and second, a source of ignition. As already pointed out, the first element is normally present only within the tanks, machine, and as far as the mask, though leaks in any part of the apparatus may result in a hazard in the immediate vicinity of the leak, and with ether by the open drop method the immediate vicinity of the container or of the mask likewise constitutes a danger zone. Ether given by the pressure method, either with oxygen or with nitrous oxide and oxygen, would be subject to the same considerations as would the gaseous anesthetics. The possible sources of ignition are much varied but are all known and all controllable. For this reason, despite the constant presence of an explosive concentration of gases, every explosion represents a case of bad technique either in routine operation or failure to observe some of the few well recognized rules.

Of the 102 explosions noted above, thirty-four were attributed to static electricity, twelve unknown or not stated. Static electricity is such an elusive condition that it is quite conceivable that the majority of the "not stated" or "not known" causes may have been static. Static electricity results from the friction of two nonconductors of electricity and may accumulate a very high potential. It is discharged immediately on contact with a conductor or on contact with an object carrying a lower potential. Thus it has been noted that a man wearing dry leather shoes developed a potential of 500 volts by taking four steps on a dry floor. If then this man made contact with a person or object carrying a 100 volt potential, there would be a discharge of static of an intensity represented by the difference in the two potentials, or 400 volts. An anesthetist seated on a rubber cushion on the conventional anesthetist's stool has been

shown to develop a potential in the order of 5000 volts. Guedel reports a case in which the brushing of a woolen skirt against the face mask resulted in a spark of sufficient intensity to cause an explosion of ether-oxygen, following nitrous oxide-oxygen induction.

In the present state of our knowledge of anesthetic hazards, the six explosions reported as due to open flame would not be excusable. That sixteen out of the 102 should be due to the use of the cautery would likewise be inexcusable in the present state of our knowledge.

Five explosions were reported as due to motors. It is of course possible that all of these were of the old unprotected motors but even if of the modern type approved by Underwriters' Laboratories for hazardous locations, it is possible that through wear and tear or neglect they may have developed defects either in the motor proper or in its external connections, which might have resulted in a spark.

Nine explosions were reported as due to use of pencil lamp, laryngoscope or bronchoscope, two of them said to be during the use of nitrous oxide-oxygen. The use of electrically lighted instruments about the respiratory tract during anesthesia probably can not always be avoided, but except for the cheap pocket "pencil lamps" this apparatus is usually designed to be free from danger if in perfect condition, but such defects as a loose bulb, a loose connection, frayed or cracked insulation on connecting wires may render the appliance a very serious hazard.

Two explosions are charged to the use of x-ray. All of the older machines did carry some ignition hazard but the modern shock-proof models of x-ray are not believed to carry any such hazard except to the extent that defects in the cables and connections might cause a spark.

Explosions reported as due to the fulgurator, diathermy, or open flame are to be expected since all present a well recognized hazard. Five reported as due to "oil" during the use of acetylene with oxygen or oxygen alone, simply emphasize the precaution never to use oil on the washers or other parts of the gas connections, as the friction of the gas may produce enough heat to ignite the oil and the oxygen will support the combustion. The one explosion due to heat from a dentist's drying syringe illustrates what unexpected sources of ignition must always be guarded against.

The above consideration of the physical characteristics of the gases and of the reported explosions points the way to the means of prevention of fires or explosions. Since we must assume that during the time any ether, ethylene, or cyclopropane is being administered, the gas or vapor is always present in an explosive concentration at least in the immediate vicinity of the tanks, machine connections, mask or patient's face, our problem narrows down to possible sources of ignition.

The most common source of ignition and the one most elusive and difficult to control is static electricity. Since static is being generated at all times and by many objects, the problem is both to remove as many as possible of the sources of static and to provide that such static as is unavoidable may be conducted away before it accumulates in a potential capable of producing a spark. Silk, wool, glass and rubber are the major factors to be considered in the production of static. Silk and woolen outer garments should be kept out of the operating room, nor should woolen blankets be used on the operating table. The problem of the woolen habits of Catholic Sisters in the operating room has long since been answered by the Holy Father and as one eminent Sister and nurse educator recently put

it: "Any sister who insists on wearing a wool habit in the operating room should not be permitted in hospital work." The interdiction of silk or woolen clothing applies particularly to outer clothing, as any clothing worn next to the skin is sufficiently damp to render it a good conductor.

Another prolific source of static is the use of rubber soled shoes, the use of rubber cushions on the table or on the anesthetist's stool, and the use of rubber tired wheeled equipment, or rubber tipped stools, instrument tables, et cetera. There is no question that the friction of rubber soled shoes on a dry floor produces a large amount of static but an even more serious angle of the question is that even on a floor grounded by the use of grids or by being kept moist—as by air conditioning—the rubber sole still retains its insulating properties and thus prevents the discharge of static generated elsewhere about the body of the wearer. One method of meeting this condition might be the incorporation of a metallic circuit in the shoe insuring an all-metallic connection between metallic contacts on the sole of the foot and on the sole of the shoe. If in turn the floor is grounded either by the use of grids or by the maintenance of a high humidity this would provide a complete grounding circuit and prevent the accumulation of static in the bodies of the personnel. The same result may be attained by the use of "dangle" chains on rubber shod equipment or in the case of legged equipment by the use of a metal skid in place of the usual rubber tip.

Ever since the dangers of static sparks were first realized it has been a common custom to install brass grids in the floors of operating rooms and to connect these grids to some grounded portion of the building. This is fairly effective so far as the floor itself is concerned but as noted above, much of the equipment and many of the personnel are insulated from the floor and unless some circuit is provided from the point of generation of the static to the grids, the grids have no chance to perform their protective function.

Lately the maintenance of a high humidity in operating rooms has been advocated for the purpose of grounding. This has the advantage that the moist air will penetrate to all points and to the surface of all objects in the operating room. The advantage of humidity over metallic grounding lies in the all-pervasive nature of the humidity, thus avoiding the gaps and other unprotected areas inherent in any mechanical system of grounding. This theory has the support of several years of successful experience in the dry cleaning industry but is not the only protection that that industry uses for the purpose. It only serves for general grounding and if the protection is to be complete, means must be provided to ensure that every point at which static may be generated is in some manner connected by an adequate conductor to a moist or otherwise grounded surface. A relative humidity of 60 per cent has been effective in dry cleaning establishments and has been advocated for hospitals. In one reported case, a humidity of this order has been reported to have failed but in studying the details of that particular case there is some evidence that the point of generation of the static was so well insulated that no amount of grounding of the room would have been effective.

Based on the principle that the intensity of the discharge is proportionate to the difference in potential of the two objects coming in contact and on his belief that no explosive mixture can exist outside a region of something like a foot in radius surrounding any gas leak, Professor Horton has suggested an intercoupler which would intercon-

nect the patient, the operating table, the anesthetist and the machine. In this manner all four would be maintained at the same potential at all times and no spark between them could occur. This is an elaboration of the technique taught by the best anesthetists that a skin to skin contact between patient and anesthetist must never be broken while the explosive agent is in use. There can be no doubt of the efficacy of this apparatus so far as the two persons and two objects connected to it are concerned but it is not a positive protection from such sources as for instance an assistant's hand touching some object in the immediate vicinity of the patient's face—a break in connection at the time of a change of anesthetists, the new one not having previously discharged his static—and similar unusual but always possible sources of static. The danger of static from the machine itself has been largely eliminated by the incorporation of ground wires in the tubes and connections but these of course are subject to breakage and the anesthetist should therefore make frequent and thorough inspections of all connections and promptly replace any part whose ground wires show any evidence of possible failure.

Another frequently incriminated source of ignition is appliances of apparatus carrying circulating current. It must be realized first that at every make or break of the current a spark is liable to occur. A loose bulb, a frayed wire or any connecting or disconnecting of circuits or any other interruption of the continuity of the circuit is a hazard. These hazards can be met only by careful inspection of all electrical apparatus before use, tightening bulbs, replacing loose connections, or wires in which the integrity of the insulation has in any way been disturbed, and providing sparkproof fittings at every point at which it may become necessary to connect or disconnect a circuit while anesthetic gases are in use or until patient has been removed from the room, gas shut off at the tank and all opened ether cans removed to a safe place. Since the danger zone is usually limited to the immediate vicinity of the patient's face this precaution will apply particularly to head lights, laryngoscopes, bronchoscopes and other illuminators.

Motors of spark proof design are the only ones approved for operating room use but like any other apparatus are subject to deterioration and should be examined frequently for defect. In practice, motors used for pressure apparatus and possibly for bone saws are the only ones that usually are at all near the danger zone and hence must be the subject of special watchfulness.

As noted above, the x-ray may present a hazard but with the modern shockless design this hazard is usually limited to the connections and these of course should be inspected carefully for defect. Fluoroscopic rooms are often so small and so poorly ventilated that concentrations of the anesthetic gas, especially after prolonged use, may exceed those usual in operating rooms and thus materially extend the danger zone. The anesthetist should exercise special care in these cases as the protective arrangements normally found in the modern operating room are less liable to be available in the fluoroscopic room.

Hazards from open flames, smoking, the cautery, the fulgurator and other electro-surgical appliances are self-evident and thoroughly understood by every experienced anesthetist, even though not appreciated by every surgeon. The anesthetist should never have any hesitancy in protesting the existence of these hazards, even to refusal to administer the anesthetic when

the use of any of these well recognized hazardous appliances is contemplated.

Recently there has been a definite effort to implicate the operating room light as an explosion hazard. In certain governmental projects the specifications have called for "explosion proof" lights, and at least two manufacturers have produced such a light. Actually there has been no report of an explosion due to the operating room light, and insurance authorities do not consider the light as being within a hazardous zone. There can be no objection to having an explosion proof operating room light providing this feature can be secured without a sacrifice of any of the other necessary characteristics of such a light. The same conditions do not necessarily apply to portable types of emergency lights, particularly those of the spot light type carrying a storage battery and an automatic switch in the base. In these lights the connections and switch are near the floor and the apparatus might at times be moved close to the gas machine. It is therefore necessary that it be equipped with spark proof connections and switches.

It likewise goes without saying that the handling and storage of tanks should be attended with the utmost precautions, all of which have been fully and carefully set forth in the literature. One precaution too often neglected is the general safety regulation that the labels showing the contents of the tank should never be obscured. The use of cloth covers on tanks is in direct conflict with this standard regulation and serves no useful purpose. The exterior of the tank has no more chance to afford a source of infection than does the frame of the instrument or the operating table, the walls or the floors.

It has not been the intent of this paper to lay down a set of rules and regulations for the prevention of anesthetic gas explosions, as this has been done by others better than this writer could hope to do. It is, however, hoped to clarify some of the principles underlying these precautions in order to assist the anesthetist in exercising his own judgment when new or unusual conditions arise, or to be able to emphasize the soundness of such rules as have already been laid down. It is a matter of common knowledge that all has not yet been learned about the actual conditions as they exist in the operating room, and it is for this reason that the American Hospital Association is sponsoring an exhaustive research on the subject by the staff of the Massachusetts Institute of Technology, and when this study is completed it is hoped to form a basis for a set of rules which will be universally applicable and generally accepted. There is as yet so much difference of opinion among authorities on the subject that it is vital that the controversial questions be definitely and finally answered with such authority as to insure their acceptance.

Meantime, the show must go on. Surgery must be performed and anesthetics must be given. Despite the explosion hazards of some of these anesthetics it is certain that they are a definite advance over older methods and that despite the occasional tragedy it is quite certain that their use has on the whole been a definite factor in reducing the surgical death rate. It is only the dramatic results of the occasional accident which has led to questioning their use. The less dramatic but more frequent death of patients who were not considered able to tolerate any of the older anesthetics, who succumbed to bronchopneumonia or to spinal anesthesia need to be balanced against the explosion hazard if the true equation is to be formulated. We must carry on, but in carrying on we must both be quick to accept every precaution of

proven value and to seize every opportunity for the education of all others concerned, particularly of the surgeons who, absorbed in their technique, may often create hazards which, if reminded, they would readily recognize and avoid.

Now that the simple apprenticeship method of teaching anesthesia is giving way to the formalized school with an approved curriculum, it is believed that the curriculum should allot a sufficient number of hours of instruction in this subject in order to train the student thoroughly in the avoidance of explosion hazards. This should include not only the study of the physical and chemical characteristics of the anesthetic agents themselves but the characteristics of the various potential sources of ignition. Since the electrical sources are least commonly understood, this might require quite detailed training in the inspection and care of all electrical equipment commonly used in the operating room and the characteristics and sources of hazard from static. The student should also be brought to the realization of his responsibility in the matter, and that such responsibility includes the prevention of the creation of hazards by any person in the operating room, even the surgeon. The surgeon is too often interested in the anesthetic only to the extent to which it facilitates his technique and the surgical recovery of his patient. The nurse who becomes an anesthetist must forget the traditional "yes sir" to everything the surgeon suggests, and learn that she is a highly trained technical assistant obligated to advise the surgeon or even to protect him from his own missteps if necessary.

Likewise it is important that every surgeon be brought to a clear realization of the hazards involved. Available literature on the subject is largely in publications not customarily read by the average surgeon or so highly technical and covering so limited a field that it does not appeal to the surgeon or that he does not see the practical application to his work. More education in the practical aspects of the prevention of explosions should be sought by way of those publications which are read by the rank and file of surgeons, rather than by the few who are especially interested in the subject. Staff meetings, county society meetings, clinical conferences, even day to day hospital contacts can all be utilized in this program of education.

If these very valuable anesthetic agents are to be saved from much unmerited criticism and their beneficial effects preserved for the patient, no stone may be left unturned in the education of every one concerned in the care of the surgical patient.

ANESTHESIA IN GYNECOLOGY AND OBSTETRICS

WM. D. FULLERTON, M.D.

University Hospitals of Cleveland, Ohio

Read at the Obstetrical and Gynecological Section of the Academy of Medicine, Allen Memorial Library, Cleveland, Ohio, October 4, 1939.

I have been asked to present to you this evening the subject of anesthesia, particularly pertaining to, and as used in the specialties of gynecology and obstetrics. As you can very well appreciate, this is a huge subject, which must, of necessity, be very much condensed to be presented in the short time at my disposal. It is quite impossible to discuss all of the anesthetic agents, and their combinations, which have been introduced during the past ninety years; some surviving the test of time, others wisely discarded.

It is reasonable to assume that such an institution as the University Hospitals, which has been progressive and active for over forty years and which for the past twenty-eight years has had a renowned school of anesthesia, has given most, if not all developed anesthetics a reasonable trial, and has retained those which have been found by use and experience to be the safest and most satisfactory. I therefore propose to discuss with you briefly the anesthetics in general use on the gynecological and obstetrical services of the University Hospitals, and say a few words relative to the selection of the best anesthetic for the individual case.

In the early days of modern anesthesia, the part played by obstetrics and gynecology in their development and general use, was unequalled by all other branches of medicine. Seeking a means to relieve pain during labor resulted in the discovery of chloroform by Simpson, and although its use for the purpose was for years generally criticized by the medical profession and the clergy, it was gradually accepted. To that fine English woman, Queen Victoria, is due great credit for overcoming prejudice, as she was one of the first to take chloroform during one of her labors and subsequently gave it her very influential stamp of approval. Since major operative gynecology, for which anesthesia was essential, was the stepping stone and ladder for the development of general surgery, gynecology can be credited, not only for its part in the development of anesthesia, but modern surgery as well.

It may be of interest historically to recall to your memory the fact that in the year 1800, Sir Humphrey Davy discovered the general anesthetic properties of nitrous oxide and had used it on himself for the relief of pain. This discovery was unheeded until December 11, 1844, when Dr. Horace Wells in Hartford, at his own suggestion and request, had one of his molars pulled without pain after inhaling nitrous oxide. After a limited number of similar cases, Wells attempted a demonstration in Boston which was a failure and he was ridiculed. On the 13th of September, 1846, Dr. William Thomas Morton of Boston, a former pupil of Wells', extracted a tooth without pain while the patient inhaled sulfuric ether. Within a few weeks, ether was used successfully in Boston in a number of surgical cases, starting a New Era in both anesthesia and surgery. On January 19, 1847, Sir James Y. Simpson of Edin-

burgh used ether successfully as an anesthetic in a case of version and extraction, before it was used obstetrically in America or elsewhere, and on February 10, 1847, reported its use in a number of obstetrical cases. Then ten months later, in November, 1847, Simpson also discovered the anesthetic effects of chloroform, and its use swiftly superseded the use of ether in Scotland and England.[1]

The selection of the anesthetic for the individual case should never be left to routine management, and is the specific duty of the surgeon, in consultation with the trained anesthetist. The clinical history of the patient, his physical and psychic condition, and the desirable operative requirements of the anesthetic should best be known to the operator, and he is primarily responsible at the time of the operation, although the suggestions and help of the well trained anesthetist are invaluable. It is extremely important that every patient's age and weight be known, as well as his general physical characteristics. The condition of the lungs, heart, vascular system and renal function should be perfectly understood, and the temperament and psychic stability of the patient should always be considered.

The requirements of anesthesia for gynecological and obstetrical cases vary markedly, and had best be evaluated separately. Whereas muscle relaxation is essential in abdominal gynecological work, it is of much less importance in perineal and vaginal operations, and often to be avoided in obstetrical procedures as it prolongs the process of labor. Whereas anesthesia in gynecology is required for relatively short periods of time, in obstetrics it is often prolonged for hours. Lowered oxygen intake and depression of the respiratory centers from drugs may be tolerated surgically, but are to be avoided obstetrically as this may be harmful to the unborn child.

Gynecological Anesthesia

On the gynecological service of the University Hospitals ether is undoubtedly the most popular and frequently used anesthetic, particularly when used in combination with nitrous oxide-oxygen, avertin, evipal, local infiltration or spinal anesthesia. We have had a very limited experience with ethylene and cyclopropane, both of which have much to recommend them, but with them there are disadvantages and dangers as well, and these will not be discussed. In the last 4500 anesthesias on the gynecological service, the various anesthetics were used in the following frequency:

	Percentage
Nitrous oxide-oxygen-ether	30.2
Epipal alone (98.8 per cent of all short anesthesias)	27.
Nitrous oxide-oxygen-ether, supplementing avertin	24.84
Evipal, plus nitrous oxide-oxygen	5.4
Evipal, plus nitrous oxide-oxygen-ether	2.7
Spinal	1.76
Nitrous oxide-oxygen	1.22

Evipal Soluble

For the past four years we have used evipal intravenously in an increasing number of cases with great satisfaction, whenever the operative procedure is of not more than 15 to 20 minutes duration.[2] Though not essential, we usually give morphine, ⅛ grain and atropin, 1/150 grain as preoperative medication. The evipal is freshly prepared by dissolving 1.0 gram in 10 cc. of sterile distilled water, and is injected intravenously. The first 2 to 4 cc. may be injected uniformly in the first 30 seconds, and the rest of the solution more

gradually during the next 2 to 3 minutes. The patient goes to sleep quickly and is well relaxed; the jaw should be supported; respiration is quiet, slightly increased in rate and somewhat depressed; there is little variation in the pulse or blood pressure. Recovery is rapid, vomiting occurs in not over 10 per cent of cases, and occasionally slight headache.

Evipal may be used alone, or supplemented with nitrous oxide-oxygen, and ether added if necessary to prolong the anesthesia. It may also be used in combination with local infiltration, and especially to supplement spinal anesthesia.

Contraindications to the use of epival are liver damage, severe infections, mechanical obstruction of the respiratory tract, and in the aged and debilitated or patients with severe cardiac disease. The amount given regulates to some extent the depth and duration of the anesthesia. We do not prolong the anesthesia by supplementary injection of the drug. Holman and Mathieu[3], Widenhorn[4], and others have reported series of cases, and we quite agree with them in their high recommendation of intravenous evipal for all such purposes as outlined.

Nitrous oxide-oxygen

Nitrous oxide-oxygen, alone, is a tried, safe and satisfactory anesthetic which may be continued for long periods, but requires most watchful and careful administration, and does not give the necessary muscular relaxation for abdominal or rectal work or permit the best bimanual pelvic examination. Induction is relatively slow, blood pressure is raised, respirations are increased and somewhat deepened. Asphyxia is to be avoided at all times, and ether added without hesitation for cardiac or respiratory stimulation whenever indicated. Nitrous oxide-oxygen has been superseded in most cases by evipal where it is not contraindicated.

Ether

Ether is used almost always in combination with either nitrous oxide-oxygen alone, or with them to supplement avertin. Preoperative medication with 1/6 to 1/4 grain of morphine and 1/150 grain of atropin is followed in 30 minutes by induction with nitrous oxide-oxygen and ether added after the patient is asleep to get the required amount of muscular relaxation.

Avertin

Avertin is tribromethylalcohol and was introduced by Eicholtz in 1924 as a rectal anesthetic for surgical anesthesia. Here it has no place, as the higher dosages are distinctly dangerous. We use it to great advantage as a premedication to subsequent general anesthesia. Usually about 20 minutes before injection 1/6 grain of morphine and 1/150 grain of scopolamine are given hypodermically. The avertin is measured carefully, dissolved in warm distilled water to make a 2½ per cent solution and injected rectally 30 minutes before operation, in doses of from 40 to 80 milligrams per kilogram of the patient's body weight,—the heavier the patient the lower the dosage per kiloram. Quiet, peaceful sleep follows injection in about 5 minutes. The patient is then moved from her room, and is spared the psychic distress and shock of transportation and operating room impressions and memories. This is of particular importance and advantage in the neurotic or nervously unstable patient. The amount of subsequent inhalation anesthesia necessary is also greatly reduced.

The great majority of vaginal operations may be readily done by supplementing the avertin with nitrous ox-

ide-oxygen alone, though satisfactory abdominal relaxation requires the addition of a small amount of ether, but not until shortly before such operation is started, and the amount of ether used is thereby greatly reduced. Respirations are soft and normal, somewhat shallowed; the pulse little changed, though blood pressure may fall 10 to 20 points. The patient usually sleeps lightly for several hours after operation, and if no ether is given, postoperative nausea is absent in 75 per cent of cases, gas pains are reduced and recovery quite serene. Avertin may be given in the presence of cardiac and pulmonary complications. The contraindications are chiefly impaired liver or kidney function, hypertension, acidosis, in the extremely obese, or patients with large abdominal tumors encroaching on the diaphragm and impeding respiration.

In 1935, Dr. James Reycraft of our staff reported the use of avertin in 564 cases between 1930 and 1934.[10] His detailed report is most interesting.

Local Infiltration

Local infiltration with novocain, although possible in many, is not readily applicable in the majority of gynecological operations and has never been popular with us. The same may be said for caudal block.

Spinal Anesthesia

Spinal anesthesia is not extensively used, but for selected and appropriate cases it is so very advantageous and helpful that I wish to discuss it in some detail, giving our modification and technique of administration, in the hope that it will be utilized more generally. Spinal anesthesia with various anesthetic agents has been used with the greatest satisfaction and success by many operators, but has been condemned by others. Faulty technique or other mismanagement has usually been responsible for failure, for if properly given it affords the ideal anesthesia for the majority of abdominal gynecological cases.

Blood Pressure: For successful administration of spinal anesthesia, a few anatomical and physiological factors should be known. The great dangers are the effects on blood pressure and respiration. The blood pressure is controlled through the vasoconstrictor centers on the floor of the fourth ventricle. These are connected with the sympathetics through the anterior horns of the cord from the first thoracic to the second or third lumbar region, so fall in blood pressure is proportionate to the number of spinal nerves affected in these spinal segments as well as by associated muscular relaxation, interference with oxygenation through paralysis of the intercostal nerves and decreased respiratory activity, and by slowing of the heart beat through paralysis of the cardio-accelerator fibers. Ephedrine stimulates the vasomotor endings, acting peripherally to the site of spinal cord motor paralysis, and therefore is very effective in maintaining the blood pressure, especially if given prophylactically.

Respiration: Automatic respiration is regulated from centers in the floor of the fourth ventricle. Efferent and afferent impulses are integrated and pass to lower cord levels, and then by way of the phrenics and intercostal nerves to the diaphragm, muscles of the thorax and anterolateral abdominal muscles. The phrenics to the diaphragm originate in the third, fourth and fifth cervicals, from corresponding segments in the cord. Muscles of the thorax and the anterolateral muscles of the abdomen are innervated by the intercostals, which are derived from the anterior roots of the twelve pairs of

thoracic nerves. The nerve fibers to the thoracic group of muscles come from the first six intercostals; to the anterolateral muscles from the last six intercostals.

This is extremely important, since if the anesthetic block is below the third lumbar segment, none of the respiratory muscles will be involved; if as high as the seventh thoracic, the anterolateral muscles are paralyzed. Breathing, although more difficult, is adequate. If all the thoracic nerves are involved, all the thoracic muscles are paralyzed, and breathing dependent on movements of the diaphragm alone. Dyspnea would be very apparent, but life maintained. Should there be further extension of the block, to include the third cervical, the phrenics are paralyzed, all respiratory movements stopped, and artificial respiration essential.

Anesthetic Levels: The sensory nerves to the lower extremities arise from the fourth lumbar to the fifth sacral segments, and pass through the posterior nerve roots; in the same way the sensory innervation of the perineum and thigh is from the third lumbar to the first sacral; buttocks, twelfth thoracic to the third sacral; groin, twelfth thoracic to the second lumbar; lower abdomen, eleventh thoracic to the second lumbar; umbilicus, tenth thoracic; upper abdomen, seventh to ninth thoracic; ensiform area, seventh to eighth thoracic; nipple line, fifth thoracic; neck, third cervical. Since the upper part of the recti muscles receive their motor nerve supply from the fifth thoracic segment, which also supplies the sensory nerves to the nipple line, satisfactory upper abdominal anesthesia must extend to this site. It is now apparent that if with a safe anesthetic agent we could control the height of spinal block and keep it out of the dangerous upper spinal levels, we should have an ideal anesthesia.

In 1927, Dr. George P. Pitkin[5],[6] developed and introduced spinocain and described a very careful and excellent technique of administration. Spinocain contains novocain and strychnine sulphate in a special solvent of sterile water, with 14½ per cent of alcohol and an amyloprolamine combination which makes it viscid. The specific gravity is slightly less than that of the spinal fluid. Each cc. of spinocain contains 100 milligrams of novocain and each ampoule 2.2 milligrams of strychnine.

We have found spinocain particularly adapted and most satisfactory in our gynecological work, as well as in a limited number of cesarean sections. The fact that the solution is lighter than spinal fluid is most important and enables us by proper tilting of the table to control the height of anesthesia accurately.

The volume and concentration of the injected solution, as well as the force and point of injection, influence the height of anesthesia. Our spinal punctures are never above the second lumbar interspace, usually the third or fourth, so that there is no danger of damage to the cord. The volume is governed by the amount of spinocain used and the amount of spinal fluid withdrawn and mixed in the syringe with the spinocain, averaging one-third to two-thirds of the anesthetic volume. The rate or force of injection is about 1 cc. every 3 seconds.

If anesthesia of the vulva, perineum and anal region alone is desired, 1 cc. of spinocain is sufficient; if to one-half way to the umbilicus, 2 cc.; if above this region, 3 cc. are injected through the third or second lumbar interspace, and with slightly more force than for lower levels. For puncture and injec-

tion, the table should be flat, the patient on her side, (never with head higher than hips) with knees flexed on the abdomen, head forward, and back bowed out and with shoulders and hips perpendicular to the table.

We insist that our spinal puncture needles be either of gold or platinum to eliminate the danger of breakage, 20 or 22 gauge to decrease trauma, and with a short 45-degree bevel. We use 5 cc. Luer-Lok glass syringes. The success or dangers of this spinal anesthesia are directly proportionate to the skill and care with which it is given, and require experience and strict attention to every detail.

Technique of Administration: To assure psychic tranquillity and to forestall any drop in blood pressure, our preoperative medication consists of 1/4 grain of morphine, 1/100 grain scopolamine, and 3/4 grain of ephedrine, given together hypodermically 30 minutes before operation. If the case is obstetrical, we substitute 6 grains of sodium amytal by mouth for the morphine and scopolamine, and give the ephedrine hypodermically.

The patient is placed comfortably on the operating table, turned on her side, and a wide area on the lower back prepared and draped. She then takes the puncture position as already described, and the desired interspace is located. Through a fine hypodermic needle a skin wheal is made with 1 cc. of 1 per cent novocain containing 50 milligrams or 3/4 grain of ephedrine. This refortifies the vasoconstrictors and also makes the spinal puncture entirely painless. The spinal puncture is then made through the wheal exactly in the midline, the needle perpendicular to the long axis of the spine. When the dura is punctured, there is a slight snap which is easily recognized with experience. The stylet is then removed and clear spinal fluid should drip from the needle. Never proceed with the injection in the presence of bloody fluid. Attach the syringe already containing the spinocain, aspirate the amount of spinal fluid desired, and inject as described and withdraw the needle. Immediately turn the patient on her abdomen, head and shoulders down, and at the same time lower the head of the table 10 to 15 degrees. This ventral position is to be maintained for 3 minutes. Since the sensory fibers emerge from the cord through the posterior roots, and spinocain is lighter than spinal fluid, this maneuver will be found very advantageous. Since the anterior-posterior spinal curvature varies materially in different backs, it is best to note carefully the bare back and depend upon sight to keep the midthoracic spine below the level of the point of injection and prevent too high a level of anesthesia. Experience in this method of regulation will be found very superior to any mechanical measurement.

After the ventral position, the patient is turned on her back and the head of the table raised slightly to about a 10 degree Trendelenburg angle, and the abdomen or perineum prepared for operation. Anesthesia is not complete for some 10 minutes after injection, and the height of the anesthesia easily tested by skin pin pricks. For abdominal work at least a 20 degree Trendelenburg position is very advantageous, and about half this angle not inconvenient for perineal work. The position is of marked advantage in maintaining the cerebral blood supply.

The advantages of spinal anesthesia are that there is complete muscle relaxation and one is able to work with more ease and less trauma. The intestines are contracted, easily controlled, and less packing off is re-

quired. Afferent impulses are blocked and shock greatly reduced. Postoperative vomiting and headache are rare, and the general recovery smooth and comfortable, with very slight or no gas pains or distention. Patients may take liquids by mouth immediately after operation and dehydration decreased. Catheterization is necessary less frequently. Many otherwise bad risks become safely operable.

Among the definite indications for spinal anesthesia are conditions of the lungs, such as tuberculosis, acute or chronic bronchitis, asthma, and emphysema, and when operation is imperative in the presence of the common cold, nephritis, diabetes, poorly compensated cardiac function, or toxemias of pregnancy when abdominal interference is necessary.[7] In peritonitis, intestinal obstruction or perforation, spinal anesthesia is most helpful, and Boland showed its great advantage in suppurative appendicitis.[8] Even considerable amounts of internal hemorrhage and relatively low blood pressure are not contraindications, as Koster has done a large series of ruptured ectopic pregnancies under spinal anesthesia with excellent results.[9] It is also most desirable with large abdominal tumors where respirations are impaired, and in blood disorders and localized infections.

The chief contraindications are extreme old age and greatly debilitated patients, severe shock, myocardial disease, very profuse hemorrhage, low hemoglobin, recent marked loss of weight, and especially diseases of the central nervous system, sepsis with positive blood cultures, or any skin infection at the point of injection.

Obstetrical Anesthesia and Analgesia

The obstetrical service of the University Hospitals is committed definitely and unalterably to the invariable and extensive use of analgesia, as well as anesthesia, during labor and at the delivery of multiparae, as well as primiparae. It has been the objective for over twenty-five years to make labor as painless as possible from beginning to end, and the results in every respect have been so uniformly satisfactory, in more than 20,000 carefully studied cases, that our procedures are firmly established and can be recommended conscientiously.

The advantages of a comfortable or painless labor begin long before labor starts. The psychological tranquillity of the patient who knows her delivery will be made comfortable is a great asset during pregnancy, resulting in greater composure, less nervousness, fear and apprehension. Relief of suffering during labor leads to a smoother convalescence and puerperium. Of great importance is the fact that labor can be better controlled. In order to relieve suffering, there is no urge for premature interference before full cervical dilatation, and too rapid expulsion can be prevented. The results of prolonged pressure on the fetal head are avoided by prophylactic forcep delivery.

The loss of sensibility to pain, with or without loss of consciousness, constitutes analgesia; if accompanied by loss of memory, amnesia results. Anesthesia in a surgical sense involves complete loss of memory and consciousness, as well as more or less muscle tone, depending upon the depth of the anesthesia.

Unfortunately, much has been said in the lay press on the subject, both pro and con, and the methods have been severely criticized by many medical writers. Finally, however, the profession has generally appreciated the beneficial effects of painless labor, and the objective at the present time is

to decide and select the best methods of accomplishing such results. Many methods have been suggested and tried, some of which have much to recommend them, but experience has taught us that no one method is uniformly applicable or satisfactory. The great majority of the bad results in carrying out analgesia in labor, are the consequences of unwise selection of cases or methods, bad management, or poor technique by untrained attendants.

For the perfect conduct of comfortable or painless labor, analgesia is essential during the first stage, but anesthesia by inhalation is required for much of the second stage, and the most satisfactory delivery. Much of our success is due to our trained, clever nurse anesthetists, who not only watch the patients during analgesia, but who during the second stage give inhalation anesthesia, at first intermittently on pains, gradually increasing to complete surgical anesthesia for most deliveries. A hasty glance at our analgesia records shows:

Morphine and scopolamine given to 88 per cent primiparae

Morphine and scopolamine given to 5 to 10 per cent multiparae

Sodium amytal given to 90 per cent multiparae

Ether-inhalation given to 5 per cent cases—advanced labor

Ether-colonic given to 5 per cent cases

Nitrous oxide-oxygen-ether given for practically all cesarean sections, with premedication of 6 grains sodium amytal

We have found morphine and scopolamine the most satisfactory agents for basal anesthesia in primiparae, though we give it to a small percentage of multiparae whose labors promise to be prolonged. Most multiparae are given sodium amytal, though pentobarbital and phenobarbital are occasionally used, as well as colonic ether with quinine, or paraldehyde, though these are usually given only supplementary to the sodium amytal.

The patient is the best judge of when she needs relief from pain after labor is definitely established, so when she is evidently uncomfortable, we start the analgesia, usually first checking the condition of the cervix by rectal examination. With morphine and scopolamine the usual practice is to give:

Morphine, grain 1/6, scopolamine, grain 1/150

Scopolamine, grain 1/200 — 45 minutes later

Scopolamine, grain 1/400 — 45 minutes later

Scopolamine, grain 1/400—repeated every 1½ hours.

With this medication, the patient usually reacts satisfactorily. She rests quietly between contractions, though may show some restlessness with them toward the end of the first stage. We rarely repeat the morphine, and then only in long labors or for extreme restlessness. We check cervical dilatation by rectal examination whenever necessary, and are particularly careful and insistent that delivery does not occur for at least three hours after the last dose of scopolamine. Strict adherence to this rule has eliminated any serious apnea in the babies. As soon as the patient becomes restless and evidences any discomfort after the last dose of scopolamine which we intend to give, inhalation anesthesia is started, and unless contraindicated, ether is preferred and given only with pains, which the anesthetist anticipates.

It is true that we deliver practically all patients by forceps, but not until the cervix is fully dilated and the head on the perineum, or well below the ischial spines. The perineum is ironed out manually, blades applied and deliv-

ery made in about one-half the number of primiparae with the aid of an episiotomy. Neither maternal mortality nor morbidity has been increased by these prophylactic forceps deliveries, which we feel are distinctly beneficial to the child, and which save the mother from a very considerable prolongation of labor.

Since labor in multiparae is usually shorter and more difficult to estimate than in primiparae, we use sodium amytal almost routinely as analgesic premedication. As soon as labor is definitely established, we give 9 grains of sodium amytal by mouth. This does not diminish the force of uterine contractions or interfere with complete relaxation between them. The effect is rapid and lasts for three hours or more, after which we occasionally give a supplementary dose, usually 6 grains rectally, if labor is slow and contractions hard, and the patient restless. There is no effect on the fetus, so that we do not have to observe a time interval before delivery. During the second stage, and for delivery, we follow the same general principles of inhalation anesthesia as for primiparae.

The general indications and contraindications for inhalation anesthesia should always be carefully considered, and may affect our choice considerably. Inhalation ether, especially by the closed method, gives rapid anesthesia and relaxes the uterus quickly, to complete inertia if carried to deep surgical degree. Even deep anesthesia with nitrous oxide-oxygen does not produce the same degree of uterine relaxation, so that the trained anesthetist can govern the force and frequency of uterine contractions by the anesthetic used as well as the amount, and what is used will depend upon the requirements of the case as specified by the obstetrician.

Interference with fetal circulation, version, prolapsed cord, intra partum bleeding, forceps rotation, and so forth, require marked relaxation, whereas to assist descent of the head either spontaneously or with forceps, uterine tone is required and nitrous oxide preferable.

I should like to say only a few words relative to surgical anesthesia in obstetrical cases where abdominal delivery is necessary, and particularly when dealing with bad risks with metabolic disturbances, diabetes, nephritis, or toxemia of whatever type, pulmonary complications, placenta praevia, and premature separation of the placenta. If the child is living or viable, premedication with sodium amytal is usually given, followed by nitrous oxide-oxygen, or these gases with ether added. Considerable criticism can be made of the practice in vogue, and I should like to advocate the use of spinal anesthesia with spinocain. Dodek has shown that with spinocain there is an increased tonicity of uterine muscle, with decreased bleeding.[11] Astley has proved that there is no effect on the fetus, less shock and trauma, less strain on the maternal heart, and no added insult to the kidney or liver.[12] Stander,[13] Eades[14] and others recommend spinal anesthesia for cesarean, and the latter's results are most excellent. In the hands of those of us who have used spinal for section, it is far more satisfactory than any other anesthesia, with many advantages for both mother and child when given carefully and properly.

Time precludes any further discussion of obstetrical anesthesia, but I should like to refer you to Dr. Arthur H. Bill's very clear and concise paper on "Analgesia and Anesthesia" as carried out on the obstetrical division at the University Hospitals.[15]

In closing, I wish to acknowledge

with grateful appreciation the many valuable suggestions of Mrs. Gertrude Fife, Director of the School of Anesthesia at the University Hospitals.

BIBLIOGRAPHY

1. Watson, B. P.: Am. Jour. Obst. & Gyn., 32: 547, 1936.
2. Council on Pharmacy: J.A.M.A., 108: 1172, 1937.
3. Holman, A. & Mathieu, A.: Am. Jour. Obst. & Gyn., 30:118, 1935.
4. Widenhorn, H. L.: Surg. Gyn. Obst., 64: 89, 1937.
5. Pitkin, Geo. P.: Jour. Med. Soc. N. J., 24: 425, 1927.
6. Pitkin, Geo. P.: Amer. Jour. Obst. and Gyn., 18: 165, 1929.
7. Pitkin, Geo. P. & McCormack: Surg. Gyn. Obst., 47: 713, 1928.
8. Boland, Frank K.: J.A.M.A., 99: 443, 1932.
9. Koster, Harry & Sheinfeld, Wm.: Amer. Jour. Obst. & Gyn., 30: 93, 1935.
10. Reycraft, James: Amer. Jour. Obst. & Gyn., 30: 332, 1935.
11. Dodek, S. M.: Surg. Gyn. Obst., 55: 65, 1932.
12. Astley, B. G. M.: Amer. Jour. Obst. & Gyn., 13: 83, 1927.
13 Stander, H. J.: Amer. Jour. Obst. & Gyn., 12: 633, 1926.
14. Eades, M. F.: Amer. Jour. Obst. & Gyn., 23: 407, 1932.
15. Bill, A H.: Amer. Jour. Obst. & Gyn., 34: 868, 1937.

PENTOTHAL SODIUM INTRAVENOUS ANESTHESIA WITH OXYGEN IN THE TWO EXTREMES OF LIFE

ANNE BEDDOW

Norwood Hospital, Birmingham, Ala.

Read at the organization meeting of the Southeastern Assembly of Nurse Anesthetists, held in Jacksonville, Florida, April 13-15, 1939.

Someone has said that the advances made in the field of anesthesia constitute a "romance of modern medicine." There has been no more fascinating development in medical research than the progress made in this field. A patient no longer goes to a hospital for operation with a vague horror of "being put to sleep", but discusses intelligently with his physician the type of anesthesia considered best for his physical condition and the surgical procedure involved.

The public today is an informed public and information which relates to health and human welfare is popular. It behooves us, therefore, to keep abreast of the more recent discoveries in our particular field, if for no better reason than to be able to converse intelligently.

Anesthesia is one of the oldest of the arts; throughout the early and middle ages, herbs and plants were used to dull the senses and give relief from pain. From the crude use of hypnotics down through the ages, scientists, physicians, and manufacturers have continued to seek the ideal anesthetic agent—one that is primarily safe for the patient during the operation and affording the least postanesthetic disturbance, and which will at the same time afford sufficient relaxation for the surgical procedure involved. From the

beginning of the nineteenth century, history shows the definite progress made in anesthesia. Passing through the various cycles of popularity, we approach the present, in which we find intravenous anesthesia classed as the most recent development. We find, however, that this method is not in reality the most recent, as it was first attempted in 1792, but such drugs as chloral hydrate and hedonal were used and did not prove satisfactory. Therefore the newer drugs, pentothal sodium and evipal, administered intravenously by a perfected technique is considered the latest development in anesthesia.

Following a series of 5000 consecutive anesthesias using pentothal sodium administered intravenously, with oxygen, the writer is convinced that when properly administered this drug more nearly reaches the ideal than any anesthetic agent yet discovered.

Pentothal sodium is one of the lighter barbiturates, is katabolized with marked rapidity and apparently leaves no ill effects. The method of administration is based on the individual's reaction, as in inhalation anesthesia. When skillfully administered it may be termed a controllable anesthetic. The patient loses consciousness as pleasantly as in falling into natural sleep. With the use of oxygen good color is maintained, and the degree of relaxation equals that of spinal anesthesia. The pulse and respiration remain nearly normal. Nausea and vomiting rarely occur, unless from predisposing causes. In a series of 1722 cases, among those receiving pantopon and atropine sulphate preoperatively, only 7 per cent became nauseated. Of those receiving morphine and atropine sulphate, 14 per cent were nauseated, 11.4 per cent complained of distention and 15.3 per cent of gas pains. There is no loss of body heat. The patient reacts according to the amount of the drug administered, and the patient to whom a larger dose has been administered will have a longer postoperative sleep. Due to the fact that sufficient relaxation is obtained, the use of abdominal packs and the handling of intestines is minimized, thus reducing the subsequent discomfort of gas pains, which tends to shorten the period of postoperative recovery. Regardless of its many advantages, the dangerous possibilities following improper administration should always be kept in mind. The results obtained are dependent upon the skill and caution with which it is used.

We have administered pentothal sodium to all types of patients for practically every type of surgery, and have observed interesting results in the two extremes of life, notwithstanding the fact that the early clinical reports warned against its use in the aged and very young.

Technique of Administration: In adults, a preliminary medication of atropine sulphate grain 1/150 with pantopon grain 1/6 to 1/3 or morphine sulphate grain 1/8 to 1/4 is given thirty minutes before induction. In children up to ten years of age, atropine sulphate alone, according to Young's rule of dosage, is given thirty minutes before operation and repeated when the patient returns to bed. This is to prevent the possibility of laryngeal spasm. With the exception of highly nervous patients and those requiring the dorsal position, the patient is fully prepared and draped before the introduction of the needle. In children this is not always possible because of fear.

The following equipment is necessary: Manometer and blood pressure cuff, machine for oxygen administration, an arm board with cushion and

an adjustable strap at wrist, and a table containing the following:—

Sterile package containing towel
20 cc. glass syringe with eccentric tip
3 rustless steel needles of assorted sizes containing stilettes
4 ounce flask of doubly distilled water
Small covered jar containing sponges
box containing cardiac and respiratory stimulants
sterile hypodermic syringe and needle
small rubber cathether
adhesive
lubricant

In a study of 2000 cases, it was found that pentothal sodium caused very little change in the blood pressure. Included in this series were 272 patients whose systolic blood pressure ranged from 140 to 200, and 23 patients whose systolic pressure ranged from 200 and over—the highest being 280/168. None of these patients showed any ill effects or cardiac damage.

The clinical reports have warned against its use in patients suffering from liver damage. A "Quick's Hippuric Acid Test" of liver function was made in 100 cases, the test being made the day previous to operation and daily for ten days following operation. There was no change in liver function and in a majority of the cases the tests were on patients having jaundice with liver damage. This same test was reported by Boyce and McFetridge in connection with other anesthetics.[1]

The hemoglobin, erythrocytes, leucocytes, differential and urine analysis were run on a large series before, during and after operation without noticeable changes. Blood chemistry was done before, during and after operation. Coagulation and bleeding time were taken before and at ten-minute intervals during operation, with the following results:

Before Operation

Blood Sugar Mgm.	N.P.N. Mgm.	Uric Acid Mgm.
96.3	31.2	4.5
Creatinin Mgm.	**Coagulation Mgm.**	**Bleeding Time Mgr.**
1.2	4.0	3.8

After Operation

Blood Sugar Mgm.	N.P.N. Mgm.	Uric Acid Mgm.
95.6	31.3	4.8
Creatinin Mgm.	**Coagulation Mgm.**	**Bleeding Time Mgr.**
1.2	3.5	3.5

Since there is no change in blood sugar, we have administered pentothal sodium to eighteen diabetics with gratifying results.

Electrocardiograms were made on 65 patients and reported by Drs. Hull and Ashburn, Louisiana State University and Charity Hospital, Drs. Kohn, Richards and Katz of Chicago and Dr. Dice Lineberry of Birmingham. These electrocardiograms were recorded before operation, at intervals during operation, immediately after operation and from one to ten days following, the age of the patients ranging from 2½ to 73 years. The only change noted was a slight increase in pulse rate in a small percentage of the cases.

Serious psychic reactions have been known to follow a child's fear of an inhalation anesthetic. Except in the very young, we experience no difficulty in anesthetizing a patient with pentothal sodium—our greatest difficulty is in securing a sufficiently large vein. In small children we do not attempt to adjust the cuff or take the blood pressure before induction, but use a tourniquet as the simplest method of procedure. In older children we place the cuff well up on the arm and attach it to the manometer. An ampule containing 0.5 gram of pentothal sodium is opened and filled with doubly distilled water.

This is placed in the syringe and an additional 10 cc. of water is added, making a 2½ per cent solution. The arm is prepared and pressure applied. The median basilic or a metacarpal vein is usually selected. Sometimes it is necessary to use the great saphenous vein anterior to the internal malleolus. The needle is introduced into the vein and the pressure released. The child will either talk or cry. The solution is injected as slowly as possible until the child loses consciousness. At this point a pause is maintained while the surgeon pricks the skin and if there is no reflex, he makes the incision. When the throat reflexes are abolished, the administration of oxygen is started. Until recently we used a nasal catheter for the administration but have found the B.L.B. oxygen therapy mask to be more satisfactory. Sufficient oxygen is given to maintain a good color. A nurse sits at the head of the table to support the jaw, keep a clear airway and record pulse and respiration. Very little anesthetic is required to maintain an even plane of anesthesia. Occasionally a hypersecretion of mucus occurs in children and for this reason a suction machine is kept available. For elderly patients the same technique is carried out, with the addition of preliminary medication of morphine sulphate grain 1/8 or pantopon grain 1/6 with atropine sulphate.

In this series of cases we have selected patients of all ages and for various types of operations. In order to assemble complete data, we have a special anesthesia sheet. When the chart is filed, this sheet is removed and filed with the other sheets. We have administered pentothal sodium to 331 children between the ages of sixteen months and twelve years, and to 245 patients between the ages of sixty and eighty-six years.

TYPES OF OPERATION IN CHILDREN

Fracture of skull and extremities, tenotomy, appendectomy, herniorrhaphy—inguinal and umbilical, incision and drainage for osteomyelitis, plastic on ear, gastrostomy, cholecystotomy, iridectomy, tonsillectomy and adenoidectomy, circumcision, intussusception, Rammstedts operation for pyloric stenosis, incision and drainage for absecses. The youngest child anesthetized was sixteen months of age, for thoracostomy. One child had repeated anesthesia for burns and skin graft.

Case Reports

No. 1. A white female, age twenty-eight, was given pentothal sodium for cholecystectomy and appendectomy. Postoperatively the patient developed an infection on the thigh, necessitating incision and drainage on thirty subsequent occasions during the period of one year. The patient preferred pentothal sodium to local anesthesia and it was given on each occasion.

No. 2. A colored male, age 38, with a blood pressure of 280/160, was passing frank blood from the kidneys. He gave permission to be anesthetized with pentothal sodium as a test case in order to see what effect it would have on the blood pressure. The patient was given 18 cc. of 5 per cent solution of the anesthetic, and oxygen was administered simultaneously through a nasal tube. The patient lost consciousness in 45 seconds and was kept under the anesthetic for 45 minutes. The blood pressure dropped from 280/160 to 262/166. The blood chemistry and coagulation time remained the same. The bleeding time dropped from 15.0 to 10.0, and there was no decrease in liver function.

CASE NO. 3. Colored female, age 18 months.

Tenotomy for Talipes.. Atropine 1/750 grain was given 30 minutes previous to operation and repeated 30 minutes later. The great saphenous vein was used for introduction of pentothal sodium,, 1¼ per cent solution, and oxygen 25 per cent was given simultaneously. Pulse 138, good volume; respiration 32, regular. Time of operation 10 minutes. The patient reacted immediately without nausea.

CASE NO. 4. White child, age 2½ years; condition grave.

Operation for Depressed Fracture of Skull with Brain Abscess. Unable to obtain blood pressure. Atropine grain 1/450, was given, followed by pentothal sodium 6 cc.—2½ per cent solution with oxygen inhalation 35 per cent. Pulse 146 and very weak; respiration 28 to 30, regular, color good. Time of operation 72 minutes. Atropine sulphate grain 1/450 was repeated before removing from table. The patient reacted quietly in an hour without nausea. This patient was later given a second anesthetic for incision and drainage and made an uneventful recovery.

CASE NO. 5. White female, age 3 years.

Operation: Right Thoracostomy. Because of cyanosis this patient was in an oxygen tent, and was removed for the operation. Atropine sulphate 1/450 grain was administered thirty minutes before operation. Five cc.—2½ per cent pentothal sodium solution was administered with 35 per cent oxygen. Time of operation eight minutes. Pulse 130 to 134, volume good; respiration 28 to 34, irregular; color pink. Atropine sulphate grain 1/450 was repeated. An airway was inserted and the patient was returned to the oxygen tent, reacting quietly in 20 minutes. Recovery was uneventful.

CASE NO. 6. White male, age 3 years.

Operation: Appendectomy—Ruptured Gangrenous Appendix.

Premedication, atropine sulphate grain 1/450. Pentothal sodium 10 cc., 2½ per cent solution with oxygen 20 per cent, was administered. Pulse 122 to 110, good volume; respiration 26 to 30, regular; color pink. Time of operation 25 minutes. Blood pressure could not be obtained before operation. At the close the blood pressure was 75/40. Atropine 1/450 grain was repeated. The patient reacted in two hours; no nausea or gas pains.

CASE NO. 7. White male, 5 years of age.

Operation: Appendectomy — Ruptured Appendix.

Premedication, atropine sulphate 1/450 grain codeine sulphate grain ¼. Blood pressure 64/48. Time of operation, 10 minutes. Pentothal sodium, 6 cc. 2½ per cent solution, with 35 per cent oxygen. Pulse 140 to 148; respiration 30 to 36; color pink. Postoperative blood pressure 70/50; atropine sulphate 1/450 grain repeated. The patient reacted quietly in thirty minutes. Vomited once on second day, and had abdominal distention on third day for a short time.

CASE NO. 8. White female, age 6 years.

Operation: Nephrectomy for Hydronephrosis.

Premedication, codeine sulphate grain ½ and atropine grain 1/400. Blood pressure 110/70; pulse 94 to 112, volume good; respiration 20 to 24, regular; good color. Pentothal sodium, 7, cc., 2½ per cent solution, was administered with 35 per cent oxygen. Time of operation 30 minutes. The postoperative blood pressure was 112/72, and the patient reacted quietly in one hour, with no nausea.

CASE NO. 9. White male, age 6 years.
Operation: Iridectomy for Congenital Cataracts.

No premedication. Blood pressure 100/64. Time of operation 15 minutes. Eight cc. of 5 per cent solution of pentothal sodium with oxygen 35 per cent was administered. Pulse 90 to 94; respiration 24; color pink. The patient reacted quietly in two hours. If a 2½ per cent solution had been used instead of 5 per cent, the patient would have reacted more quickly. Postoperative blood pressure was 100/62. Pentothal sodium is particularly favorable for eye operations or any operation on face or head, as the anesthetist is clear of the field.

CASE NO. 10. White male, age 11 years.
Operation: Cholecystotomy and Appendectomy.

Premedication, pantapon grain 1/12 and atropine sulphate grain 1/300. Blood pressure 118/58. Time of operation 30 minutes. Pentothal sodium, 30 cc. of 2½ per cent solution, with oxygen 40 per cent, was administered. Pulse 110 to 102, of good volume; respiration 26 to 24, regular; color good. The patient reacted quietly in 45 minutes, with blood pressure 112/60, and no nausea or vomiting. Atropine sulphate grain 1/300 was given postoperatively.

CASE NO. 11. White female, 9 years of age.
Operation: Splenectomy (for Hemorrhagic Purpura)

Condition grave; blood pressure 75/40. Pentothal sodium, 13 cc. 2½ per cent solution was given, with oxygen 35 per cent. Pulse 120 to 130, volume fairly good; respiration 28 to 36; extreme pallor. Time of operation 20 minutes. Postoperative blood pressure 65/40. The patient was placed in oxygen tent, and reacted quietly in 30 minutes, with no nausea.

CASE NO. 12. White male, age 67 years.
Operation: Cholecystectomy.

This patient had stone in the gallbladder and common duct and was one of the patients operated upon before we adopted the technique of a dilute solution for elderly patients. The premedication consisted of pantapon grain 1/3 and atropine grain 1/150, thirty minutes before operation. At time of induction the blood pressure was 130/95. The patient was given 18 cc. of 5 per cent solution of pentothal sodium, with oxygen 40 per cent. Pulse was 80 to 88, good volume; respiration 24 to 28, regular; color pink. No packs were used. The gallbladder was removed, time of operation 25 minutes. Postoperative blood pressure was 125/90. The patient reacted quietly in one hour and thirty minutes; respiration 18; pulse 78; blood pressure 130/90. Patient had no nausea, vomiting, gas pains or distention, and made an uneventful recovery.

CASE NO. 13. White female, age 81 years.
Operation: Open Reduction, Fracture of Femur.

Premedication, morphine grain 1/6 and atropine sulphate grain 1/150. Blood pressure 114/68. Pentothal sodium, 15 cc. of 2½ per cent solution, with oxygen 35 per cent, was administered. A graft was removed from the tibia and pegged into the femur. An x-ray was made of graft and patient remained under the anesthetic for 35 minutes. The postoperative blood pressure was 120/70; pulse 90 to 100, good volume; respiration 18 to 22, regular; color pink. The patient reacted in one hour, and was nauseated the first day. Pantapon was substituted for morphine and nausea subsided.

CASE NO. 14. White male, age 69.

Operation: Open Reduction, Compound Comminuted Fracture of Tibia and Fibula.

The patient was admitted to the operating room in semi-shock, and 500 cc. of 6 per cent acacia solution was administered intravenously. Premedication, adrenalin chloride, 8 minims, and pantapon grain 1/6, atropine sulphate grain 1/150. Blood pressure was 108/72; respiration 12; pulse 130. Seven cc. of pentothal sodium 2½ per cent solution was administered, with oxygen 40 per cent. Pulse became very weak, and the blood pressure 100/60. Coramine 5 cc. was given intravenously, and the pulse volume improved. Time of operation 42 minutes. The patient reacted in 25 minutes, with no nausea. The blood pressure returned to 108/72; respiration 20, pulse 96.

CASE NO. 15. White male, age 78.

Operation: Amputation of Leg, for Diabetic Gangrene of Foot.

Premedication, atropine sulphate grain 1/150. Preoperative blood pressure was 146/58. Thirty cc. of 2½ per cent solution of pentothal sodium was administered with 35 per cent oxygen. The pulse was 72 to 114, intermittent, volume good; respiration 18 to 20, regular. This patient perspired freely and the blood pressure dropped 10 points. He was under the anesthetic for 20 minutes, and reacted in one hour. Postoperative blood pressure was 140/58. The patient had a slight attack of nausea and vomiting on the second day, but recovery was otherwise uneventful.

CASE NO. 16. White male, age 68 years.

Operation: Kraske.

This patient had a two-stage operation for carcinoma of rectum, sigmoid and anus. He was so impressed with the quality of the anesthesia, that he expressed a desire to give his impressions, which were as follows: "I had a horror of being put to sleep and of having my face covered and undergoing a feeling of smothering. It was a great relief to be permitted to lie quietly and count and gradually lose consciousness. I had the same drowsy feeling one has when falling asleep while reading. I remember saying fourteen and feeling very sleepy, and knew nothing more until I asked my wife the time after my return to my room. Except for the strangeness of the room it was just like awakening any morning and thinking it was time to get up." This patient was under the anesthetic for 20 minutes and two weeks later underwent the second stage of the operation—resection of the sigmoid, rectum and anus, without apprehension. The operation required one hour and ten minutes. The blood pressure was 100/64 preoperatively. Thirty cc. of 2½ per cent pentothal sodium solution was administered, with oxygen 40 per cent. The pulse was 60 to 72 and of good volume; respiration 20 to 24 and regular; color pink; blood pressure 108/65. The patient reacted in one hour, with blood pressure 110/65. With the exception of a slight attack of nausea on the second day this patient had an uneventful recovery.

CASE NO. 17. White female, age 83 years.

Operation: Open Reduction of Fracture, with Insertion of Steinman Pin; Comminuted Fracture of Surgical Neck of Humerus.

Preoperative blood pressure was 118/94. Premedication, morphine sulphate grain 1/8, atropine sulphate 1/200 grain. Pentothal sodium, 11 cc. 2½ per cent solution was administered, with oxygen 40 per cent. The pulse was 86 to 90, good volume; respiration 18 to 20, regular; color pink. Time of operation 62 minutes. Postoperative blood pressure was 120/94. The patient

reacted quietly in 20 minutes, with no nausea or vomiting.

CASE NO. 18. White male, age 81 years.
Operation: Inguinal Herniorrhaphy (for Strangulated Hernia).

The patient was suffering from cardiac decompensation, arteriosclerosis and hypertension, and the blood pressure was 190/100. Premedication, morphine sulphate grain 1/8, atropine sulphate grain 1/200. Pentothal sodium, 9 cc. of 2½ per cent solution was administered with 60 per cent oxygen. Time of operation 35 minutes. The blood pressure dropped to 90/40 and the pulse became imperceptible. Coramine 2 cc. was given intravenously and acacia 500 cc. 6 per cent solution was given immediately by the intravenous method. The blood pressure returned to 140/70. The patient reacted quietly in 20 minutes. The blood pressure two hours later was 180/90. There was no nausea, and slight gas pains only, and recovery was uneventful.

CASE NO. 19. White male, 70 years of age.
Operation: Insertion of Moore Pin with X-Ray Following.

The patient was brought to the operating room with fracture at neck of femur. The blood pressure was 160/94; pulse weak and irregular. The patient had given a history of luetic heart and inability to lie down for two years. Premedication, pantopon grain 1/6, atropine sulphate 1/150 grain. Pentothal sodium 15 cc. of 2½ per cent solution was administered, with oxygen inhalation 45 per cent. The respiration became irregular and pulse weaker. Metrazol 3 cc. and coramine 5 cc. were given intravenously. Blood pressure dropped to 105/60. An x-ray was taken following the insertion of the pin. Patient was under the anesthetic 27 minutes. Acacia 500 cc. of 6 per cent solution was given intravenously before removal from the table. The patient reacted quietly in one hour. The postoperative blood pressure was 150/96. There was no nausea or vomiting.

CASE NO. 20. White female, age 60, obese.
Operation: Subtotal Thyroidectomy.

Blood pressure preoperatively was 146/70. Time of operation 15 minutes. Fourteen cc. of 5 per cent pentothal sodium, with oxygen 40 per cent, was administered. The pulse was 90 to 86, volume good; respiration 20 to 22, regular; color pink. The cough reflex was present. Postoperative blood pressure was 140/70. The patient reacted quietly in 25 minutes, and there was no nausea or vomiting.

CASE NO. 21. White male, 76 years of age.
Operation: Suprapubic Cystotomy.

Premedication, morphine sulphate grain 1/6, atropine sulphate grain 1/150. The blood pressure preoperatively was 170/120. Pentothal sodium, 15 cc. of 2½ per cent solution, was administered with oxygen 40 per cent. The pulse was 88 to 90, good volume; respiration 18 to 20, regular; color pink. Time of operation 30 minutes. The blood pressure at closure was 158/120. The patient reacted quietly in 30 minutes. There was slight nausea and vomiting on the second day.

CASE NO. 22. White male, 62 years of age.
Operation: Resection of Ruptured Peptic Ulcer and Ligation of Gastrohepatic and Gastrosplenic Arteries.

Premedication, atropine sulphate 1/150 grain (morphine administered before admission to hospital). The blood pressure preoperatively was 135/80. Pentothal sodium, 15 cc. of 2½ per cent solution was administered with 60 per

cent oxygen. The color became pale, blood pressure dropped to 120/72, and pulse volume weakened. Coramine 5 cc. was given intravenously, and pulse volume improved. The blood pressure at closure was 130/80. Time of operation 48 minutes. The patient reacted quietly in 40 minutes, and had no nausea or vomiting.

Conclusion: Despite the fact that early clinical reports warned against the use of pentothal sodium in patients having low blood pressure, anemia, circulatory diseases, hepatic or renal diseases, organic or obstructive respiratory diseases, diabetes or hypertension; poor surgical risks; for long and major operations, and in both extremes of life, we have found after careful study, and with cautious administration of the drug in five thousand consecutive anesthesias embracing all types of operations, that when administered skilfully and cautiously, pentothal sodium is a safe and pleasant anesthetic. It gives the least postanesthetic disturbance and affords the surgeon sufficient relaxation for any operative procedure that may be desired.

Reference:

1. Southern Medical Journal, 35:31, 1938.

THE MEASURED ADMINISTRATION OF ANESTHETIC AND AUXILIARY GASES

HELEN LAMB

Barnes Hospital, St. Louis, Mo.

Read at the Southeastern Assembly of Nurse Anesthetists, held in Jacksonville, Florida, April 13-15, 1939.

With the acceptance of the newer anesthetic and auxiliary gases into the anesthetist's armamentarium, special interest attaches to the mechanisms by means of which these modern agents are administered in accordance with progressively developed up-to-date techniques; and in speaking on this subject, I first emphasize the specific individual merit of, and definite place for, each one of the four great general anesthetic agents—nitrous oxide, ethylene, cyclopropane and ether—either alone or in combination with one of the others, for its own specifically preferred procedure or patient. As very brief illustrations of the basis for this general pronouncement, I cite the following practical clinical instances.

Nitrous oxide

As a characteristic preferential indication for nitrous oxide (with basal rectal supplement if necessary), I point out the cases in which the use of a cautery in the field eliminates the use of inflammable ethylene, cyclopropane or ether, and where the selection of the anesthetic agent is therefore necessarily limited to the non-inflammable agents nitrous oxide or chloroform; of which nitrous oxide becomes the anesthetic of choice because of contraindicating pharmacological characteristics of chloroform.

Cyclopropane

As a typical indication for cyclopropane, I call attention to intrapulmonary procedures wherein ether is contraindicated because of its inherent property of respiratory irritation, and where neither nitrous oxide nor ethylene is sufficiently potent to provide adequate

narcosis with proper accompanying full oxygenation of patient.

Ethylene

Ethylene evidences its own specific advantage for certain of those same intrapulmonary cases, where the reaction of the individual patient to cyclopropane renders continuance of that agent undesirable, but wherein unsupplemented low potency nitrous oxide would be ineffective (a basal supplement being contraindicated because of its depressant effect upon the cough reflex).

I start then from the premise that all three of the anesthetic gases, nitrous oxide, cyclopropane and ethylene, have specific individual preferential indications in surgical anesthesia and should therefore be provided for on an inhalation anesthesia apparatus which is to be regarded as completely adequate for the servicing of the broad range of surgical procedures of the active, progressive, general surgery clinic.

Oxygen

In addition to the anesthetic gases themselves, each "gas anesthesia" mechanism must necessarily be equipped to deliver accurately measured volumes of oxygen, and should also be equipped to deliver a similarly accurately metered supply of carbon dioxide; although in view of differences of opinion regarding the method of use of this agent, my simple statement on that point requires amplification.

Carbon dioxide

Physiologists agree that carbon dioxide is the most effective respiratory stimulant available. Whether this carbon dioxide is accumulated from rebreathed exhalations, or whether it be administered from an independent cylinder supply, the pharmacological effect in similar concentrations is the same. In the first instance (from rebreathing) the accumulation is slow and erratic, whereas in the second instance (from cylinder supply) it is promptly available to exactly the required degree.

Experience amply demonstrates that by the skillful use of carbon dioxide during the administration of nitrous oxide and ether, a smooth, progressive induction to narcosis is effected without the intervening "hesitant, shallow-respiration, vomitus-threatening phase" that otherwise often characterizes the late stage of induction by those agents. Clinical experience also shows that the use of an independent supply of carbon dioxide when needed during surgical anesthesia, assists in the maintenance of a smooth, controlled level plane of narcosis, which may be promptly changed to a different zone if required by a change in the surgical procedure.

For resuscitative procedures, when necessitated by hemorrhage, shock, et cetera, a quickly available definite supply of carbon dioxide, plus oxygen and helium, with fluids (blood), is the technique par excellence for improving blood pressure, pulse volume and tissue oxygenation.

Postoperative hyperventilation, which is considered of great prophylactic value by many surgeons, and definitely demanded by them, is impossible to conduct properly with the necessary open exhaling valve to speed elimination of the anesthetic gases, excepting by the incorporation of a definite concentration of carbon dioxide; which under those circumstances can be obtained only from an independent cylinder supply, since rebreathing is then no longer in effect or available without defeating one of the objects of the procedure, viz., "rapid deanesthetization."

Helium

In considering this latest addition to our group of auxiliary gases (helium),

it is to be noted that the clinical use of this increasingly important agent amply justifies its use (1) as an alleviant to stridor and allied respiratory difficulties during anesthesia, (2) as a regular component part of both the surgical-anesthetic mixture and the hyperventilating mixture and (3) as a calculated part of the gas mixture administered in resuscitative procedures.

These clinical techniques are based upon the comprehensive research work of painstaking investigators, who have demonstrated human reactions to helium which assign to it a specific and distinct place in the anesthetist's armamentarium of administrative agents.

For instance, Barach in 1934, by administering experimentally to human subjects a calculated mixture of helium and oxygen in place of the mixture of nitrogen and oxygen which constitutes ordinary atmospheric air, demonstrated that while all of the oxygenating properties of the mixture were defended and maintained, there was a reduction in the resistance to breathing amounting to from 25 per cent to 50 per cent. This fact of "reduction of breathing effort," is one of the reasons for using helium as a part of anesthetic technique.

A second reason for the use of this gas as a calculated part of the anesthetic mixture, is its extremely low density ("thinness," "ease of flow," "rapid diffusibility"), which causes it to carry its mixed companion gases (cyclopropane and oxygen) to the distant alveolar areas, thereby increasing anesthetic effectiveness and aeration.

A third reason for the use of helium, both as a part of the anesthetizing and hyperventilating mixtures, arises from the fact of its very slow absorption in the pulmonary endothelial structures, through which all gases must diffuse which pass from the lung alveoli to the circulating blood. This important fact, the specifically slow solubility of helium in the endothelial tissues, was established by Coryllos and Birnbaum in 1932, when they demonstrated (upon dogs) that helium took something like forty times as long to completely empty from an occluded lung lobule, as did oxygen, nitrous oxide or ethylene—and while cyclopropane was not included in those experiments (not having at that time come into clinical usage) its known physical constants indicate that it would follow the pattern of the other gases experimented with, particularly ethylene.

The significance of the slow passing of helium from lungs to blood, was incorporated into a postulate by Burford in 1938, that atelectasis may in some cases be due to rapid passing of gases from poorly ventilated lung alveoli to circulating blood, thereby leaving the alveolar structure uninflated or collapsed—a condition which might be prevented by incorporating into the breathed mixture an inert gas with a characteristic of slow tissue solubility, by reason of which it would retard the emptying (into the blood) of poorly supplied or partially occluded alveoli; thereby inhibiting or reducing the incidence of atelectasis.

As a result of the work of the investigators named in this paper, it is proposed to administer helium with and as a part of the anesthetic mixture, one volume of helium to two volumes of cyclopropane. We ourselves are working with a technique employing equal parts of helium and cyclopropane but await further laboratory and clinical confirmation.

On the basis of the same investigations, and consequent to clinical experience, helium is definitely indicated as a component of the hyperventilating mixture. We use it regularly, the technique being to inaugurate the hyperventilation by administration of a mix-

ture composed of 50 per cent oxygen, 41 per cent helium, and 9 per cent carbon dioxide, with open expiratory valve to facilitate elimination of the anesthetic. The length of time required to secure the desired depth of breathing varies with the patient, but is always brief — usually requiring only from eight to ten inspirations. At reaching the desired depth of respiratory exchange, the carbon dioxide is discontinued and the patient permitted to respire the flowing oxygen-helium mixture for five full inspirations with the exhaling valve still open, after which all gas flows are discontinued and the mask removed.

From the foregoing it is obvious that the modern anesthetizing machine should be provided to deliver accurately calibrated volumes of this increasingly important auxiliary gas helium, thus removing its administration from the earlier "spurt" or "flood" techniques, and instead enabling its administration as a precisely calculated component of an anesthetic, a prophylactic or a resuscitative mixture.

Machine Calibrations

Since the up-to-date anesthetizing machine is to be equipped to deliver the now discussed six anesthetic and auxiliary gases, I approach the very practical detail of what calibration shall be considered specifically suitable for each of those six gases—and here it is to be noted that considerable variation of opinion is reflected in the several groups of calibrations that have been heretofore specified by both anesthetists and manufacturers of the equipment. My feeling is, however, that many of these variations can be assessed to the fact that the particular mechanisms have been calibrated for restricted fields or for particular purposes; and that such variations are not at all irreconcilable with a recommended "general purpose" calibration for those machines which are intended to serve a broad, active, general surgery service, where from time to time each one of the agents will be required for administration by modern techniques particularly suited to the surgical procedure at hand.

Cyclopropane. There is very little difference of opinion regarding a calibration suitable for cyclopropane administration, where the potency and restricted method of administration of the agent (closed circuit entirely, both as a matter of economy and of reducing ignition hazard) brings a universal calibration of *1,000 cc. per minute* well within the range of every usage.

Ethylene. The next older agent, ethylene, also lends itself reasonably well to agreement on calibrations, although in view of its lesser potency and therefore open-exhaling-valve during induction (to establish its tension in the place of systemic nitrogen) its volume of delivery is necessarily scaled considerably higher. A calibration of *6 liters per minute* services satisfactorily both "open valve" induction and "closed circuit" administration of this agent.

Nitrous oxide. While currently functioning anesthetizing machines show quite varied calibrations for the administration of our oldest and longest used anesthetic gas, nitrous oxide, these differences again seem to be due to the limitation of certain machines to restricted usage, and are not at all at variance with a "universal" calibration for mechanisms which are to be used for administering this agent in "general service," where it will be called upon to function in both "open exhaling valve" and "closed system" anesthesias.

As an illustration of circumstances in which non-inflammable nitrous oxide will be administered by the equivalent

of an "open valve" method, I point out (1) a group of procedures such as laryngectomy, esophagoscopy, et cetera, in which the volume of insufflated nitrous oxide will reach 7 liters per minute in adult cases, and (2) cautery pneumectomy with freqeunt bronchial fistula (also change of chest packs in bronchial fistula), in which the flow of nitrous oxide not infrequently rises 7 liters per minute. In these and allied circumstances a calibration of *7½ liters per minute* is necessary, if the administration is to be removed from a "bubble and guess" technique, with no knowledge of either anesthetizing or oxygenating concentration being actually delivered.

Oxygen. In turning from the anesthetic agents to our auxiliary gases, I feel it desirable to state what I think is fundamental, that is, that every calibration on an anesthetizing machine should be proportioned to and based upon the other agents on the same machine, with which it will be administered either continuously or intermittently. For instance, assuming a nitrous oxide calibration of 7½ liters, the oxygen calibration to service that agent should read 1,900 cc., in order that at the maximum flow of nitrous oxide, the administered mixture may definitely contain 20 per cent oxygen. I therefore recommend *1,900 cc. per minute* as the "fine flow" oxygen calibration, clinical evidence having clearly demonstrated that such calibration may also be satisfactorily used for regulation of the finer "metabolic" flow utilized in closed circuit administration.

The practice of postoperative prophylactic hyperventilation, which is demanded by many surgeons, obviously requires provision for a materially greater volume of delivery of gases, but does not modify the necessity that they be delivered in known and controlled concentrations — hence accurate calibration of these greater volumes is equally imperative. When postoperative hyperventilation is conducted by means of oxygen and carbon dioxide alone (without inclusion of helium), the volume of oxygen required sometimes reaches the rate of *15 liters per minute*, which calibration for "coarse oxygen" is recommended.

Carbon dioxide. To induce within the required time, the desired increase in tidal exchange during brief postoperative hyperventilation, a concentration of up to 9 per cent of carbon dioxide is demonstrated clinically. Since the coarse oxygen flow during such hypreventilation sometimes reaches 15 liters, a measured delivery up to *1,500 cc. per minute* of carbon dioxide must of necessity be provided for; in view of which that calibration is recommended for that agent.

Helium. Helium, like oxygen, requires two quite different rates of flow for different administrative procedures: (1) a "fine flow" for administration as a precise component part of cyclopropane anesthesia, and (2) a "coarse flow" for administration as part of a hyperventilating or resuscitative mixture. Since the volume during cyclopropane anesthesia is based upon and is parallel to that agent, it is recommended that the fine flow of helium be similar, or *1,000 cc. per minute.*

When helium is used as a calculated part of the hyperventilating mixture, its proportion may be calculated to constitute as much as 41 per cent of the total mixture—41 per cent helium, 50 per cent oxygen, 9 per cent carbon dioxide) but when used in a succeeding prophylactic deanesthetizing mixture may constitute as much as 75 per cent of the total flow (75 per cent helium, 25 per cent oxygen)—therefore the coarse flow calibration for helium is recommended as *12½ liters per minute.*

Summary

In concluding this paper, and to sum up the recommendations made; while recognizing the province of "limited capacity" anesthetizing machines, when their usage is restricted to the special purposes for which they are designed, I feel strongly that the anesthetizing machine which is to be used over the full, broad range of surgical demands that are inherent in the progressive, active surgical clinic (what I term an "all purpose" machine), should be so designed and equipped as to permit the anesthetist to administer the full range of the anesthetic and auxiliary gases (plus ether vapor, of course), and I suggest as calibrations for such equipment the following volumes:

Cyclopropane .....1,000 cc.
Nitrous oxide .....7½ liters
Ethylene .....6 liters
Oxygen (fine) .....1,900 cc.
Oxygen (coarse) .....15 liters
Carbon dioxide .....1,500 cc.
Helium (fine) .....1,000 cc.
Helium (coarse) .....12½ liters

each of which is based upon a definite calculation, as set forth in this paper.

References:

Barach, Alvan L., Anesthesia and Analgesia, Sept.-Oct., 1935.

Coryllos, P. M., and Birnbaum, G. I., Am. Jour. Med. Sc., March, 1932.

Burford, Geo. E., Anesthesia and Analgesia, Sept.-Oct., 1938.

GIFT

In the report of the activities of the Missouri Association given at the annual meeting, a letter was read from Miss Anna Gettinger, Secretary of the Missouri Association, stating that the Missouri organization had voted the sum of Fifty Dollars to be given to the National Association, as an expression of gratitude for the support and help that the National organization had given the Missouri group. Miss Gettinger sent best wishes for a succesful convention.

In Memoriam

Miss Elsie Mae Palmer, of Children's Hospital, Pittsburgh, Pa., died Sunday, September 24, 1939. Miss Palmer had been a member of the National Association of Nurse Anesthetists since 1934. She was graduated from the Oil City Hospital School of Nursing and from the Grace Hospital School of Anesthesia in Detroit, Mich.

NOTICE

Miss Alpha Schier, St. Joseph Infirmary, Atlanta, Ga., has been appointed Secretary-Treasurer of the Georgia Association of Nurse Anesthetists to fill the unexpired term, following the resignation of Miss Caroline Hohenschutz.

COMING MEETINGS

The second annual meeting of the Southeastern Nurse Anesthetists' Assembly will be held in Gulfport, Mississippi, March 28-30, 1940, in conjunction with the Southeastern Hospital Conference. Gertrude Fife, University Hospitals of Cleveland, Ohio, will be a guest speaker on the program—subject "Anesthesia in Surgery of the Heart." For further information write Mrs. Rosalie McDonald, President, Emory University Hospital, Emory University, Ga., or Mrs. Ida Tedford Ellis, Secretary-Treasurer, 1210 Kuhl Avenue, Orlando, Fla.

The seventh annual meeting of the Ohio Association of Nurse Anesthetists will be held April 2-4, 1940, in Columbus, Ohio, in conjunction with the Ohio Hospital Association. For further information write Miss Mildred Sauers, Secretary-Treasurer, City Hospital, Cleveland, Ohio.

The ninth annual meeting of the Pennsylvania Association of Nurse Anesthetists will be held May 8-10, 1940, in Pittsburgh, Penna., in conjunction with the Hospital Association of Pennsylvania. For further information write Mrs. Helen Young Walker, Secretary-Treasurer, 1824 Wallace Street, Philadelphia, Penna.

The sixth annual meeting of the Minnesota Association of Nurse Anesthetists will be held in Minneapolis, Minn., May 23-25, 1940, in conjunction with the Minnesota Hospital Association. For further information write Miss Dorothy L. Koch, Secretary, Minneapolis General Hospital, Minneapolis, Minn.

Miss Mary Lucile Goodman, University Hospitals of Cleveland, Ohio, was was Executive Secretary of the National Association of Nurse Anesthetists from 1935 to 1937, was married to Mr. Burton Kellogg on October 24, 1939. The officers and trustees, as well as those of the general membership who know Mrs. Kellogg, wish her much happiness.

FORM OF BEQUEST OR CONTRIBUTION

In response to inquiries reaching the headquarters of the American Association of Nurse Anesthetists the following form is suggested as a proper one to follow:

"I give, devise and bequeath to the American Association of Nurse Anesthetists' Trust Fund the sum of..... dollars, or property or holdings as follows:

All income from the Fund known as the American Association of Nurse Anesthetists' Trust Fund will be used for the aged and indigent nurse anesthetists who qualify for participation in the benefits of said fund as stated in Trust Fund Document.

Signed.....

(Address in full).....

Date ....

BULLETIN OF THE NATIONAL ASSOCIATION OF NURSE ANESTHETISTS

The Bulletin of the National Association of Nurse Anesthetists is published by the National Association of Nurse Anesthetists; Executive, Editorial and Business Offices, 2065 Adelbert Road, Cleveland, Ohio.

Publishing Committee: Gertrude L. Fife, Chairman; Jewelle Fink, Harriet L. Aberg, Rose G. Donovan.

Entered as second class matter February 6, 1937, at the Postoffice at Cleveland, Ohio, under the Act of March 3, 1879.

Published quarterly; subscription price—members 50¢ per year; nonmembers, $1.00 per year.

EDITORIAL COMMUNICATIONS

The Bulletin invites concise, original articles on anesthesia. Description of new technics and methods are welcomed. Articles are accepted for publication with the understanding that they are contributed solely to the National Bulletin.

Manuscripts submitted for publication may be sent to Gertrude L. Fife, University Hospitals, Cleveland, Ohio.

The National Association of Nurse Anesthetists does not hold itself responsible for any statements or opinions expressed by any contributor in any article published in its columns.

Manuscripts. — Manuscripts should be typewritten on one side of the paper only, with double spacing and liberal margins. References should be placed at the end of the article and should conform to the following style: viz., name of author, title of article, and name of periodical with volume, page, and year.

Illustrations accompanying manuscripts should be numbered, provided with suitable legends, and marked on margin or back with the author's name. Authors should indicate on the manuscript the approximate position of text figures.

Illustrations — A reasonable number of half-tones will be reproduced free of cost to the author, but special arrangements must be made with the Chairman of the Publishing Committee for elaborate tables or extra illustrations.

Reprints. — Fifty or more reprints may be obtained at a nominal cost if ordered within fifteen days following the date of publication of the Bulletin. Single reprints of any article published may be obtained from National headquarters, 18 East Division Street, Chicago, Ill., at a price of 10¢ each.

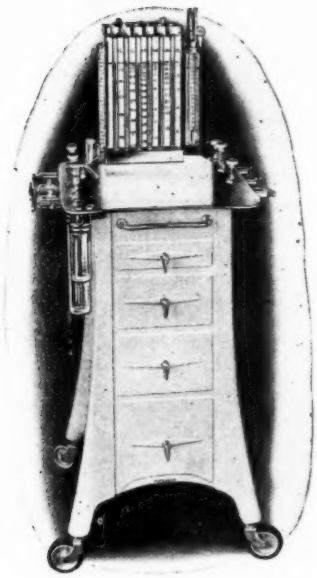
BUSINESS COMMUNICATIONS

All communications in regard to advertising, subscriptions, change of address, et cetera, should be addressed to the Chairman of the Publishing Committee, 2065 Adelbert Road, Cleveland, Ohio.

The Chairman of the Publishing Committee should be advised of change of address about fifteen days before the date of issue, with both old and new addresses given.

Because of the second class postal rates in effect the Postoffice does not forward the Bulletin unless extra postage is sent to the Postoffice to which the Bulletin was originally mailed.

Non-Receipt of Copies. — Complaints of non-receipt of copies should be made within ten days following date of publication, otherwise the supply is likely to be exhausted.



THE NEW O.F. MODELS

INCREASED VISIBILITY—no floats required as flow meters are outside of water container. 8½" between minimum and maximum readings on each scale, hence fine regulation possible without eye strain.

SIMPLICITY UNEQUALED—no moving parts, hence no mechanical adjustments required.

SAFETY—no static-generating friction at any point within apparatus or breathing circuit. Gases are mixed in water chamber before leaving apparatus proper, hence do not depend on patient's respiration for adequate humidity.

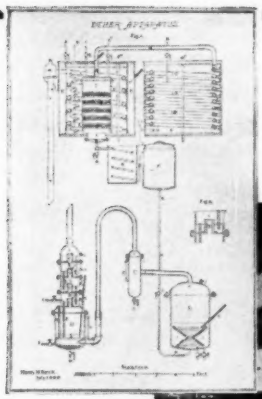
DURABILITY—rugged construction and greater endurance than even our old Gwathmey models which practically never wore out.

DEPENDABILITY—backed by over 25 years experience—first with individually calibrated flow meters—first to adopt metric system for easy computation of percentages—first practical carbon dioxide absorption apparatus—first cabinet apparatus.

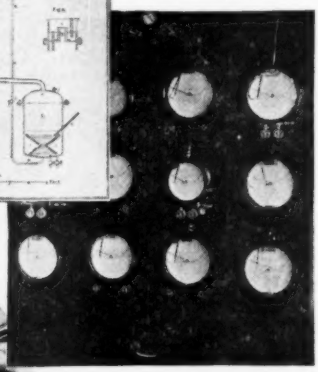
THE FOREGGER COMPANY, INC.

55 West 42nd Street, New York City

These Things
BUILD CONFIDENCE



86 Years of Ether Production . . . Originally, ether was made by the open-fire, intermittent distillation method—involving the problems of fire hazard and the selection of the proper fraction of the distillate to be used for anesthesia. In 1853, Dr. E. R. Squibb perfected his process for the manufacture of ether by continuous steam distillation. His process made ether *safe* for anesthesia.



Rigid Control Standards . . . Important as are the standards set by the Squibb Laboratories in the selection of the raw materials used in making ether, the secret of its uniformity lies in its elaborate control during manufacture. A control panel keeps a chart record of temperatures and specific gravity during production. Sensitive devices automatically control each important step in the process of manufacture, thus assuring the *quality* of Squibb Ether.

Copper-lined Protection . . . Experience has shown that ethers develop aldehydes and peroxides when packed in ordinary containers. Years of research resulted in the development of the patented copper-lined container in which Squibb Ether is now packaged. The container definitely protects the *high purity* of Squibb Ether—the only ether protected by a copper-lined container.

Clinical Experience . . . Squibb Ether is used in over 85 per cent of American hospitals and in millions of cases every year. What greater evidence is there of the confidence of surgeons and anesthetists in the high uniform purity, potency, and safety of Squibb Ether?

For literature address the Anesthetic Division
E. R. Squibb & Sons, 745 Fifth Ave., New York

SQUIBB ETHER

You can place confidence

in **CHENEY** *Products*

Nitrous Oxide
Ethylene
Oxygen
Cyclopropane
Carbondioxide
Helium
Carbondioxide—Oxygen Mixtures
Helium—Oxygen Mixtures

We still have available some of the monographs "Cyclopropane—A Study of the literature" Write for your copy.

Anesthetic Gas Machines & Replacement Parts

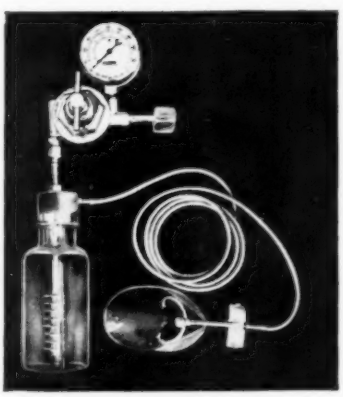
Equipment for Oxygen Administration

◆

An Addition to our Equipment for Oxygen Administration

The Improved Lombard Inhaler

1. It is efficient.
2. It is inexpensive.
3. It is comfortable.
4. It is compact and light.
5. It is simple to operate.



6. It has a hinged face piece enabling patient to take food and water without removing the inhaler.
7. This face piece is not costly. A new hood for each patient.

The Improved Lombard Inhaler is universal. It can be used on bed patients, office patients and ambulatory patients.

THE CHENEY CHEMICAL COMPANY

2929 East 67th Street, Cleveland, Ohio

Branches in Principal Cities

APPROVED!

by Leading

HOSPITALS and ANESTHETISTS

Everywhere!

OHIO ANESTHETIC GASES

BACKED by exhaustive research which provides highest purity . . . and relentless vigilance which constantly maintains uniform quality.

PROTECTED in thoroughly cleansed modern cylinders . . . immaculate inside and out **before** "uniformly-high-in-purity" OHIO gases are compressed into them. Exteriors are refinished EACH TIME cylinders are filled, to be in harmony with YOUR spotless surgery.

SEALED VALVES guard against the intrusion of dirt or grease . . . and readily distinguish between full and empty cylinders.

SPECIFY "OHIO" the next time YOU order Nitrous Oxid, Ethylene, Cyclopropane, Carbon Dioxid or Oxygen. YOUR surgeons and anesthetists will appreciate the ADDED assurance and peace of mind OHIO gases insure.

OHIO CHEMICAL & MFG. CO.

PIONEERS AND SPECIALISTS IN ANESTHETICS

1177 Marquette Street **Cleveland, Ohio**

BRANCHES IN ALL PRINCIPAL CITIES